EFFECTIVENESS OF CLOSED SYSTEM MANUAL BREAST PUMP VERSUS HAND EXPRESSION ON BREAST ENGORGEMENT AMONG POSTNATAL MOTHERS ADMITTED IN POSTNATAL WARD AT GOVERNMENT RAJAJI HOSPITAL, MADURAI.

M.Sc (NURSING) DEGREE EXAMINATION

BRANCH – III OBSTETRICS AND GYNAECOLOGICAL NURSING

COLLEGE OF NURSING

MADURAI MEDICAL COLLEGE, MADURAI -20.

A Dissertation submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY,

CHENNAI – 600 032.

In partial fulfillment of requirement for the degree of

MASTER OF SCIENCE IN NURSING

APRIL – 2016

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CERTIFICATE

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ACKNOWLEDGEMENT

I consider it as a privilege to express my gratitude and respect to all those who helped me in accomplishing this task successfully. The satisfaction and pleasure that accompany the successful completion of any task would be incomplete without mentioning the people who made it possible.

First of all, I praise and thank my God Almighty, ever changing with reverence and sincerity for his heavenly choicest blessings and abundant grace, which strengthened me in each and every step through put, this endeavor.

I would like to express my deep and sincere gratitude to **Dr.M.R.Vairamuthuraju, M.D(GM).,** Dean, Madurai Medical College, Madurai, for granting me permission to conduct the study in this esteemed institution.

I express my heartfelt and faithful thanks to **Mrs. S. Poonguzhali., M.Sc.(N), M.A.,M.BA.,Ph.D.,** Principal, College of Nursing, Madurai Medical College, Madurai for granting permission to conduct the research and for providing her continuous support, constant encouragement and valuable suggestions that helped in the fruitful outcome of this study.

My deep sense of gratitude to **Dr.T.Umadevi, M.D.,D.G.O.,** Head of the Department of obstetrics and gynecology, Government Rajaji Hospital, Madurai for giving permissions and also for her valuable suggestions and guidance to complete this study.

My sincere thanks to **Dr.S.Shanthi M.D.,D.G.O.,** Professor, Department of obstetrics and gynecology, **Dr.K.S.ChitraM.D.,D.G.O.,DNB.,** Professor, Department

of obstetrics and gynecology, Government Rajaji Hospital, Madurai, for giving her valuable suggestions and guidance to complete this study.

I also express my sincere gratitude to **Ms.P.Malliga, M.Sc(N).,M.A.(Soc)** Nursing Tutor Gr.II, College of nursing, Madurai Medical College, Madurai -20.For her elegant direction and corrections made on my study which helped me a lot to come up to this stage. I thank her for her full support which kindled my spirit and enthusiasm to go ahead and accomplish this study successfully.

I also express my sincere gratitude to **Mrs.S.AuyishaSithik, M.Sc.(N).,M.B.A(HR)**., Nursing Tutor Gr. II, College of nursing, Madurai Medical College, Madurai -20 for her elegant direction and corrections made on my study which helped me a lot to come up to this stage. I thank her for her full support and enthusiasm to go ahead and accomplish this study Successfully.

I extent my special thanks to all the **Faculty members ,**College of Nursing, Madurai Medical College, Madurai, for the support and assistance given by them in all possible manners to complete this study.

I also extend my thanks to **Mrs.P.ShanthiM.Sc(N), Profesor** in OBG Nursing, CSI Jeyaraj Annpackiam College of Nursing, Pasumalai, Madurai for validated the tool for this study.

I wish to extend my sincere thanks to **Mrs.C.Radha,M.Sc.(N).,** Associate Professor in OBG Nursing, Karpagavinayaga college of Nursing, Puthukottai, for validated the tool for this study.

I wish to extend my sincere thanks to **Mrs.S.JeyasankariM.Sc (N)** Associate Professor in OBG Nursing, PIMS college of Nursing, Pandicheri, for validated the tool for this study.

I extent my thanks to **Mrs.P.SathyabamaM.A.,M.Ed.,M.Phil.,** Tamil Literature for Tamil Translation and editing the Tool and I also thank to **Mrs.N.Shanthi, M.A., B.Ed.,** English Literature, for her help in editing the Manuscript for the study.

I wish to express my sincere thanks to Statistician for extending necessary guidance for statistical analysis and for his suggestions and help to complete the study.

I express my thanks to **Mr.S.Kalaiselvan**, **M.A,** Librarian, College of Nursing, Madurai for his assistance in collecting the related literature for this study.

My affectionate thanks to my husband Mr**. M.Stephen** and my dear son **S**.**Kewin Leon**, my daughter **S.Revarich,** who has been the backbone of my endeavours and my family members for their care, assistance and support throughout this study.

Finally I extend my heartfelt thanks to the women who have participated in the study for their kind co-operation towards completion of the study.

I owe my great sense of gratitude to **Laser Point,** Vasantha Nagar, for the enthusiastic help and sincere effort in typing the manuscript with much valuable computer skills, for the translation of the tool and also for untiring, innovative, diligent effort for carefully printing my dissertation.

I extend my heartfull thanks to my department mates **Mrs.V.Vanitha, Mrs.P.Velammmal, Mrs.N.Sangeetha, Miss.A.Ajitha Rani** and to all my class mates for their continuous support, strength and guidance from the beginning to the end of this research study.

I dedicate this dissertation, to My heavenly father **KING JESUS CHRIST** and My worldly Ever lovable and Dedicated Mother (late) **Mrs.S.AmalaPushpa Rani.**

ABSTRACT

Title: "Effectiveness of closed system Manual Breast pump versus Hand expression on breast engorgement among postnatal mothers". Objectives: To assess the level of breast engorgement. To evaluate the effectiveness of closed system Manual Breast pump for group-I and Hand expression to group-II on breast engorgement. To compare the effectiveness of closed system Manual Breast pump and Hand expression. To associate the level of breast engorgement score with selected demographical variables. **Hypothesis:** There is a significant difference between pre and post-test level of breast engorgement. There is a significant difference in post-test level of breast engorgement. There is a significant association in level of breast engorgement among post-natal mothers with their selected socio-demographic variables. **Methodology:** The conceptual frame work based on modified J.W.Kennys open system Model. Quantitative approach- true experimental comparative research design was adopted. The study was conducted in postnatal ward at Government Rajaji Hospital, Madurai. 60 samples selected by simple random sampling technique. **Intervention:** Closed system Manual Breast pump for group-1 and Hand expression for group-II. The level of breast engorgement was assessed by 6 point Lactation Consultant scale and Storr scale**. Results:** Pretest and posttest difference of breast engorgement and pain score in group-I was 28.3%, 32%. In group-II, 38.3%, 40%. The obtained "t" value for group-1 was 6.29 at p= 0.01 level of significant, and for group-II "t"= 10.78 at p=0.001 level of significant. **Conclusion:** statistical evidence proved that Hand expression of breast milk is more effective than closed system Manual Breast pump in reducing the breast engorgement.

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INTRODUCTION

“Mother, the most beautiful word on the lips of mankind.” - Kahlil Gibran

The word ‘Postnatal’ comes from the Latin word ‘post’ which means ‘after’ and ‘natalis’ means ‘of birth’. It is the period beginning immediately after the birth of a child and extending for about six weeks.

A postnatal mother may leave the hospital as soon as she is medically stable, though the average for spontaneous vaginal delivery is 3-4 days, and the caesarean section postnatal average stay is 6-8 days.post natal complications may arise any time throughout the postpartum period. The major focus of postpartum care is ensuring that the mother is healthy and capable of taking care of her newborn, prevents postpartum complication, equipped with all the information she needs about breastfeeding, reproductive health and contraception, and the imminent life adjustment. Early postpartum care is essential to diagnose and treat complications such as puerperal infections, secondary postpartum heamerrhage,and breast complications such as breast engorgement and mastitis.

As a mother, one of the greatest things they can do for their infant is breastfeeding. Breast milk is always fresh, perfectly clean, just has the right temperature and is a healthy choice at the minimum cost. Breastfeeding can give benefits to both mother and baby. Breast milk provides the main source of nutrition for newborns before they are able to eat and digest other solid foods. Besides, the activity of sucking at the breast enhances development of baby’s oral muscles, facial bones and aids in optimal dental development. Lack of breastfeeding increases the risk to the

infant of ear infections, childhood diabetes, obesity, childhood cancer and many more. Scientific literature identifies breast milk as providing protection from many diseases including otitis media, respiratory illness, gastroenteritis, allergy and respiratory illnesses. Absolute contraindications to breastfeeding are extremely rare and limited (American Academy of pediatrics- 2012).

For mother, research shows that breastfeeding benefits their health. It will increase levels of oxytocin that stimulates postpartum uterine contractions, minimizing blood loss and encouraging rapid uterine toning.

Under Reproductive Child Health care program Phase-II(2005-2015) about 28 million pregnancies and 24 million deliveries occur every year in India.15% of all deliveries have complication. Maternal deaths are shockingly high in India. Engorgement of the breast is one of the potential problem that may arise due to the delay in the initiation of breast feeding and usually starts from 3rd to 5th postnatal day and usually disappears within 48 hrs. NFHS -3 data reflects the initiation of breast feeding within one hour is only 24.5%, while the exclusive breast feeding rate is less due to lack of awareness among women.

Exclusive breast feeding saves many infants lives by preventing malnutrition and infections. Breast feeding should be initiated early as possible if there is no contraindication for feeding. It's normal and healthy to feed a newborn 10-16 times in 24 hours. This will also prevent milk from building up in breasts.

The World Health Organization recommends that infants be fed exclusively on Breast milk from birth to six months of age. Children who do not receive breast milk are more likely to suffer health problems. Breast milk feeding of infants in neonatal units is vital to the preservation of short and long term health. Although breastfeeding practices is universal in our country, harmful practices such as pre lacteal feeds, delay

in initiating breast feeding, discarding of colostrums and giving the baby water in between feeds are still common. This will lead to breast engorgement. A mother can breast feed her baby even during acute illnesses unless she is too sick to do so. Breast feeding is recommended even with mastitis and breast abscess from the unaffected side.

Breasts are already developed throughout pregnancy in response to hormonal stimulus. For the first few days both breast feeding and non breast feeding breast of women secrete colostrums, a creamy yellow precursor to milk, but the breast remain soft and non tender. Three days after delivery in response to increased prolactin level breast become firm, tender and milk supply is initiated. They rapidly become distended, hard and warm because of increased flow, venous and lymphatic congestion called physiological engorgement, lasts about 24-48 hours and will resolve spontaneously, sucking stimulates ongoing milk production. The breast will remain firm, tender until emptied by nursing. Breast engorgement and nipple trauma are the complications associated with breastfeeding and considered as the most significant factors impacting on breastfeeding in the first weeks of motherhood.

Storage capacity of the breast is considered the amount of milk the breast holds when it is full. The storage capacity of the human breast ranges from 196 to 242 ml (Daly *et al.*, 1993). However, storage capacity of the breast changes during lactation and likely increases to accommodate an increase in demand for milk production, as well as storage capacity, responds to the infant demand for milk mediated by the degree of emptying of the breast. (Kent *et al.*, 2006).

Engorgement can be defined as congestion and distension with fluid. Literature refers to engorgement as the physiologic condition characterized by the painful swelling of the breasts associated with the sudden increase in milk volume, lymphatic and vascular congestion, and interstitial edema during the first 2 weeks following birth.

Engorgement is a normal physiologic process with a progression of events, not a result of trauma or injury to tissues.

In breast engorgement the breast feeding of the baby is affected because of improper lactation which needs expressing breast milk manually or by using breast pump. The secret to preventing engorgement or at least minimizing it is to nurse frequently and unrestrictedly from birth.

Common cause of engorgement is Nipple soreness, inappropriate feeding technique or other difficulty, nipples may be severe enough that the mother is reluctant to feed, nipple candidiasis, thrush of the nipple, cleft lip and cleft palate and Tongue-tied. This can lead to significant nipple pain during feeding for the mother and inadequate milk transfer for the infant. Hand expression or pumping may be beneficial to augment milk removal from the breast until the infant is able to efficiently remove milk.

The incidence rate of breast engorgement all over the world is 1:8000 and in India it is 1:6500. Engorgement symptoms occur most commonly between days 3 and 5, with more than two – thirds of women with tenderness on day 5 but some as late as days 9 – 10. Two – third of women experience at least moderate symptoms. More time spent breast feeding in the first48 hours is associated with less engorgement. The 20% post- natal mothers especially primipara mothers are affected with breast engorgement from 0 – 4 days of post – natal period.

Not all babies are able to feed at the breast because of Prematurity, Illness, Abnormalities, Separation from their mothers. These babies need expressed breast milk. Mother also express milk for their own comfort if they have Sore nipples, Engorgement , To increase milk supply, To leave milk if away from their baby.

Importance of breast feeding indicates that both timing of initiation and type of breastfeeding pattern exert independent influences on neonatal mortality. In India almost 7 out of 100 babies do not see their first birthday and nearly 65 % of these infant deaths occur in the neonatal period, namely, the first four weeks of life. The current neonatal mortality rate in India is 45 per 1000 births. In 2007 neonatal mortality rate was 44 per 1000 live births, which accounts for nearly 30 % of total 39 million neonatal deaths worldwide and it accounts for 2/3rd of Infant mortality rate and half of Under 5 Mortality Rate. Two newborns' death occurs every minute in this vast country. India contributes to 25% of the over 10 million Under 5 deaths occurring world wide each year. Present IMR rate 2013 is 40 per 1000 live birth as per Sample Registration Survey.

Interventions to improve early infant feeding practices can result in considerable reductions in neonatal mortality. Neonatal mortality could be reduced by 16.3% if all infants initiated breastfeeding on day 1 of life and by 22.3% if initiation took place within the first hour. The risk of neonatal death is increased approximately fourfold if milk-based fluids or solids are provided to breastfed neonates.

Most of the working mothers have insufficient time and that makes the breastfeeding becomes very hard to perform and mothers cannot maintain their milk supply to their infants and develop post natal breast complications. In consequence, the best solution to overcome this problem is by using the breast pump or Hand expression. There is also some common reason of why the mothers use a breast pump such as to stimulate their milk production when they are unable to nurse their infant after birth. A breast pump allows mother to store milk in bottles or storage bags for later use, and then bottle-feed it to baby or mix a little cereal when he or she reaches the solid food stage. Mothers can refrigerate breast milk safely for five to seven days, or freeze it for

up to a year (Bregram et al., 2010).Breast milk is best stored in a hard plastic container made of polypropylene with a solid lid. Other containers such as soft-sided bags promote spillage and loss of IgA. For healthy term infants, freshly pumped milk may remain at room temperature for 3-4 hours at temperatures 27-32 °C or 80.6-89.6 °F. For lower ambient room temperatures milk may remain at room temperature for 6-8 hours without bacteria growth.

Milk expression is the physical removal of milk from the breast with the use of mother's Hands alone, by a mechanical device such as a breast pump, or by combining Hand expression with breast pumping. If the mother and infant are separated by illness or prematurity and direct feeding from the breast is ineffective or delayed, milk removal should begin as early as identified that feeding will be interrupted. If the delivery is due to prematurity or the infant is unable to directly breastfeed, then prompt milk removal should commence in the recovery period, the first 2 hours postpartum (Slusher*et al.*, 2007, 2012). Subsequent removal includes regularly expressing milk every 2-3 hours for 15 minutes and at least 2 minutes beyond the time milk flow ceases (Meier *et al.*, 1993). Utilizing Hand expression with the use of the electric pump may lead to increased milk yield (Morton *et al.*, 2009).

The National Family Health Survey has shown that painful breast is the second most common reason for giving up breast feeding in the first two weeks after birth. One factor contributing to such pain can be breast engorgement. It is reported that 20-85% of the mothers are affected by breast engorgement. Breast engorgement can occur any time during lactation when milk is not transferred from the breast.

According to different researchers there is strong evidence that effective and adequate breast feeding without any supplementation is a preventive measure for the engorgement of the breast. The investigator from her experience felt that breast

pump and Hand expression can reduce the incidence of breast engorgement and promote breast feeding.

Engorgement can be prevented by immediate, successful, and frequent breastfeeding. Treatment includes rest and Hand expression or pumping before nursing to soften the breast, leading to greater maternal comfort. Expression of breast milk has become increasingly prevalent, particularly in some developed countries, concurrently, breast pumps have evolved to be more sophisticated and aesthetically appealing, adopted for domestic use, and have become more readily available.

A Randomized trial in the USA which compared Hand expressing and pump use found that Hand expression appeared to improve breast feeding rates at two months when compared with using a pumps are considerably more expensive than simple Hand expression or the use of Hand operated pump.

The use of Hand expression or breast pump can help establish milk flow and maintain a good milk supply. Even brief pumping can soften the breast to make it easier for an infant to attach appropriately and extract further milk. It's important to be able to empty breasts and relieve engorgement, because the engorgement put pressure on the milk producing glands and can quickly decrease milk supply. If the baby cannot latch or not nursing well the mother need to use breast pump or get help with breast feeding.

Dr.Jane Morton demonstrates how easily Hand expression can be taught to mothers. Until recently Hand expression of milk has been an under-utilized skill in our institution. But there are many benefits of knowing how to express milk from the breast without the use of expensive or cumbersome pumps. Dr. Jane Morton showed the video of Hand expression of milk and it was worth effective.

Neonatal deaths are very high all over the world. Exclusive breast feeding for the high risk babies will help to reduce the neonatal mortality rate. Manual Expression

of Breast milk or Hand expression will help the postnatal mothers to express the breast milk correctly for their pre term and high risk babies and mothers those who all are having interrupted breast feeding.

1.1.Need for the study

"Breast Milk Nature's Protection for the Baby" One million infant lives can be saved by just breast feeding in the first hour following the birth of the child. If mothers and families comprehend the benefits of breast feeding for six months, it can save the life of 250,000 babies annually. Breastfeeding offers newborns all the nutrition required and therefore the World Health Organization recommends exclusive breastfeeding till the baby is six month.

First and foremost thing is that, the mother should have a vast idea about the importance of breastfeeding. Breastfeeding is an effective way to reduce neonatal mortality rate and to prevent breast engorgement. The implementation of this task is very important for the maintenance and protection of children, especially in the early days of growth and development.

"World Breastfeeding Week - 1–7 August" is initiated with a goal to boost the health of neonates and infants worldwide and encourage mothers to breastfeed. The theme of the world breastfeeding week for the year 2015 is "Breast feeding and work-lets make it as work." The theme emphasizes that the mother can give the breast milk if she is away from her child by using expressed breast milk.

Breast engorgement is the most common complication during the postnatal period. It is the disease condition occurs in the mammary glands by expanding veins and the pressure of new breast milk contained within them. Severe engorgement may lead to mastitis and untreated engorgement puts pressure on the milk ducts often causing a plugged.

According to Academy of breastfeeding medicine protocol committee, Breast engorgement is defined as "the swelling and distension of the breasts, usually in the early days of initiation of lactation, caused by vascular dilation as well as the arrival of the early milk .

The common causes of engorged breasts are other feeds given to baby before starting breastfeeding, delayed starting of breastfeeds, long intervals between feeds, early removal of the baby from the breast while breast feeding, bottle-feeding and any other restrictions on breastfeeding. Signs and symptoms of breast engorgement is General body temperature about 1-2 degree on the 3rd or 4th postpartum day usually indicate mild or moderate engorgement, pain, tenderness in one or both breasts, edematous and flushed Nipples and may be retracted into the surrounding skin.

Adequate management of engorgement is important for successful long-term lactation. The goal of treatment of breast engorgement is to relieve discomfort and control swelling. It includes analgesics, ice packs, an uplift support bra to minimize edema & frequent nursing. New breastfeeding mothers have several options for relieving normal postpartum breast engorgement such as breast massage, application of warmth, cold compresses, and Hand expression or use of a breast pump.

This normal breast fullness can develop into engorgement if the baby isn't nursing often enough, if mother is separated from her baby and do not remove the milk frequently and effectively. When the normal breast fullness is not relieved, fluid builds up and swelling occurs. The breasts become hard, and the skin is taut and shiny. They become extremely tender and painful, and mother may run a low-grade fever and become achy. The swelling may extend into the area under the arms, and in very severe cases can cause numbness or tingling of Hands from pressure on nerves.

Because the breast is so full and swollen, the nipple and areola may flatten out making the tissue difficult for the baby to grasp.

The preventive aspect of breast engorgement is feed frequently. The mother has to nurse at least 10-12 times in 24 hours – every 1 ½ - 2 hours during the day, with no more than a 3 hour stretch at night. Try to nurse for at least 15 minutes on the first side before offering the second.

Breast feeding should be initiated within an hour of birth instead of waiting several hours as is often customary. Feeding frequently and long enough helps to make sure baby is removing enough milk. Mother has to focus less on the clock and feed baby often. It's normal and healthy to feed a newborn 10-16 times in 24 hours. This will also prevent milk from building up in breasts.

Mothers with premature infants and those returning to work outside the home, breastfeeding is not always either possible or practical. It is important that the expression of milk from the breast be as efficient and comfortable as possible. so that these mothers can provide expressed breast milk for their infants. During breastfeeding, milk ejection is triggered by neural impulses from infant sucking stimulating the release of oxytocin from the posterior pituitary gland. An infant stimulates the milk ejection reflex at the beginning of a feed by sucking rapidly, between 72 and 120 sucks/min, before slowing to 60 sucks/min once milk starts to flow.

The Manual Breast pump is great for mothers who stay at home or are able to their child for feedings during the work day while electric breast pump is a better choice for mothers who are frequently separated from the babies because of work or health problems. Usually, the breast pumps are designed to satisfy the needs, the health and the comfort ability of mothers.

Milk expression may provide additional breast stimulation to increase milk production, but the hormonal response to expression is not identical to infant sucking, and expression may have other important differences from sucking as well. Some studies have shown that breast pumping removes more milk than Hand expression, breast pumping may be seen as superior to Hand expression. However, some experts have observed that Hand expression may result in larger milk volumes immediately after birth. Infants who are not latching well or not sucking well are at increased risk of early breastfeeding discontinuation. Excessive newborn weight loss, initiation of formula feed, maternal pain, maternal frustration and lower milk production due to inadequate breast stimulation may all contribute to breastfeeding discontinuation in this group, and milk expression is often recommended to improve breast stimulation and milk production.

A mother may also choose to pump exclusively if her baby does not latch properly, is hospitalized after birth, or cannot nurse for physical reasons e.g. cleft palate, cleft lip etc. If the mother needs to take medication that affects the breast milk, the mother may pump and dump and may resume nursing after the course of medication is complete. Pumping is desirable to continue lactation and its associated hormones to aid in recovery form pregnancy even if the pumped milk is not used. Feeding preterm infants with breast milk lower rates of necrotizing enterocolitis. When infants are unable to suckle, mothers can pump if they wish their babies to be fed with the mothers own milk.

The aim of this study is promotion, protection and support of breastfeeding, prevention of breast engorgement and complications and early initiation of breast feeding. A Meta analysis of randomized controlled trials (RETS, Boyd et,al 2007) has shown that formula fed low birth weight infants have five times the risk of necrotizing

enterocolitis a condition associated with a mortality of approximately 20% and significant long term health care costs among survivors. Reduced neuro developmental attainment has been shown among low birth weight infants fed on formula.

Investigator had seen many mothers who are suffering with breast engorgement, mastitis and breast abscess during post natal period. Because of this the baby will not receive adequate milk, the breast may not empty completely and the nipples may become sore and cracked thus indirectly affects the newborn. The nurse should be aware of the effective treatment of engorged breast and the complications so that to some extend can reduce the suffering of mothers.

Based on the review of literature and the personal experience of the investigator in the clinical found that in many hospitals breast engorgement are involved several practices such as cold cabbage leaves treatment, cold packs, warm compress, warm compress, drug treatment to relief pain and comfort and easy expression of milk. Being a women, the investigator hence rightly felt the need to popularize one of the effective methods of reducing breast engorgement following labour.

In this study the researcher is interested to know about the effectiveness of closed system Manual Breast pump and Hand expression on breast engorgement. Because many women with inverted or flat nipple cannot fed the infant and they develop breast engorgement finally they forced to stop the breast feeding. By applying the Manual Breast pump or Hand expression the breast engorgement will be relieved and there is a chance to improve the nipple condition and improve the lactation. There is no need to stop the breast feeding due to engorgement or other reason unless it is contraindicated.

1.2. Statement of the problem

"A study to evaluate the effectiveness closed system Manual Breast pump versus Hand expression on breast engorgement among postnatal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai".

1.3.Objectives of the study

- To assess the level of breast engorgement to group-I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To evaluate the effectiveness of closed system Manual Breast pump for group-1 and Hand expression for group-II on breast engorgement among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To compare the breast engorgement score between group-I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To associate the level of breast engorgement score with their selected socio-demographical variables to groups- I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital.

1.4. Hypothesis

H_1 : There is a significant difference between pre-test and post-test level of breast engorgement among group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.

H_2 : There is a significant difference in the post-test level of breast engorgement between group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.

H_3 : There is a significant association in the level of breast engorgement among group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai with their selected socio-demographic variables.

1.5. Operational definitions

Effectiveness: In this study it refers to the outcome of closed system Manual Breast pump and Hand expression in reducing discomforts and pain of breast engorgement among postnatal mothers and is assessed by using 6 point Lactation Consultant scale and Storr scale.

Closed system Manual Breast pump: In this study it refers to it is a mechanical device powered manually that create vacuum and extracts the milk from the breasts of the postnatal mothers with breast engorgement.

Hand Expression: In this study it refers to Expressing milk from the breast by Hand to reduce the breast engorgement among postnatal mothers.

Postnatal mother:

In this study it refers to women those who delivered an alive baby by normal or caesarean section and they have interrupted in breast feeding, with firmness, tenderness, swelling in the breast and expected to stay about more than 5 days and group-I those who receive Manual breast pump and group-II means those who receive Hand expression and admitted in Post- Natal wards at Government Rajaji Hospital, Madurai.

Breast engorgement:

In this study it refers to swollen, distended, firm and tender breast due to expansion and pressure exerted by synthesis and storage of breast milk.

1.6. Assumptions

1. Postnatal mothers may have different level of breast engorgement.
2. Breast engorgement may lead to mastitis, breast abscess and leads to poor feeding to neonate.

1.7. Delimitation

- Postnatal mothers who were admitted in post natal ward at Government Rajaji Hospital.
- Data collection period is limited to 6weeks.

1.8. Projected outcome

Manual Expression of Breast milk or Hand expression will reduce the breast engorgement among postnatal mothers.

REVIEW OF LITERATURE

CHAPTER-II

REVIEW OF LITERATURE

"It is a critical summary of research on a interest after prepared to put a research problem in context or as the basis for an implementation project'-'**Polit and Hungler**

Related research literature was reviewed to broaden the understanding and to gain insight into the selected area under study. The review is organized in the following headings.

2.1. Studies related to breast engorgement.

2.2. Studies related to methods used for reducing breast engorgement.

2.3.Studies related to Hand expression.

2.4.Studies related to Manual Breast pump

2.1 Studies related to breast engorgement

Marsha Walker (2015) report in this article Baby Center, LLC that breast engorgement occurs in the mammary glands due to expansion and pressure exerted by the synthesis and storage of milk. Engorgement usually happens when the breasts switch from colostrum to mature milk. Engorgement can also happen later if lactating women miss several nursing and not enough milk is expressed from the breasts. It can be exacerbated by insufficient breastfeeding and/or blocked milk ducts. When engorged the breasts may swell, throb, and cause mild to extreme pain. Engorgement may lead to mastitis and untreated engorgement puts pressure on the milk ducts, often causing a plugged duct. The woman will often feel a lump in one part of the breast, and the skin in that area may be red and/or warm. If it continues unchecked, the plugged duct can become a breast infection, at which point mother may have fever or flu-like symptoms.

Dowson,E.K(2014) conducted a cross sectional study to find out the prevalence of breast engorgement and breast feeding among postnatal mothers and reported that breast engorgement is caused by an imbalance between milk supply and infant demand. It often occurs in women who decide not to breastfeed. Breast engorgement can occur due to four main factors such as a suddenly increased milk production that is common during the first days after the baby is delivered or when the baby suddenly stops breastfeeding either because it is starting to eat solid foods or it is ill and has a poor appetite.

Glover,R.(2014)conducted an analytical study to assess the causes of breast engorgement among postnatal mothers. Breast engorgement may also be caused when the mother does not nurse or pump the breast as much as usual. After the first 3 to 4 postpartum days, the quantity of colostrum is quickly replaced by an increased milk production. When milk production increases rapidly, the volume of milk in the breast can exceed the capacity of the alveoli to store it and if the milk is not removed, the alveoli become over-distended which can lead to the rupture of the milk-secreting cells. Severe breast engorgement can lead to the flattening of the nipples or, it can result in inverted nipples which make it impossible for the baby to suck out all the milk from the breast. This is one of the common causes of the stagnation of milk in the breast.

Newton,M.(2014) conducted a descriptive study to assess the breast engorgement that they found, Not all women experience breast engorgement after they give birth and some degree of engorgement of the breast is normal within the few postpartum days. Over filled breasts can lead to severe engorgement due to waiting too long to begin breastfeeding the baby, not feeding often enough or due to

small feedings that do not empty the breast, very common in cases when the baby is fed formula or water. Severe engorgement of the breast can lead to breast infection.

Breast engorgement is due to exaggerated normal venous and lymphatic engorgement of the breasts which precedes lactation. This in turn prevents the escape of milk from the lacteal system. The primiparous and the mother with inelastic breasts are likely to be involved. Engorgement is an indication that the baby is not in step with the stage of lactation. It usually manifests after the milk secretion starts(third or fourth day postpartum).Symptoms include considerable pain and feeling of tenseness or heaviness in both the breasts, generalized malaise or even transient rise of temperature and painful breast feeding. (**Dutta -2013)**

Menczer,J*(*2013) conducted a cross sectional studies shows that engorgement typically begins on the 3rd to 5th day after birth, and subsides within 12-48 hours if properly treated. The breast will typically feel hard, with tightly stretched skin that may appear shiny, and may experience warmth, tenderness, and/or throbbing. Engorgement may extend up into the armpit. The areola will typically feel hard (like the tip of your nose or your forehead) rather than soft, with tight skin that may appear shiny. The nipple may increase in diameter and become flat and taut, making latch-on challenging, engorgement may occur in the areola and/or body of the breast, may occur in one or both breasts.

It is thought that breast engorgement of the breasts is due to a combination of milk accumulation and stasis and increased vascularity and congestion. It occurs on approximately the third postpartum day in both breast feeding and non breast feeding mother and lost approximately 24 to 48 hours. Treatment of breast engorgement is important to the breast feeding mother as unrelieved breast engorgement suppresses the milk supply .(**Annamma Jacob -2012)**

Breast engorgement usually occurs on the third or fourth post partum period when the milk production in the breast rises. But as the baby`s need increases and suckling becomes more vigorous, there is increased production of milk for the baby. Blood supply to the breast rises. The increased blood supply to the breast causes engorgement of the breast tissue which presses on the ducts damming the milk in the lobules. As the breast tissue gets more and more engorged, it pulls on the nipple, flattening it, or even inverting it. The baby may be unable to suck out all the milk from the flattened nipple, causing more stagnation. Both increased milk supply and stagnation of milk are responsible for breast engorgement. (**Nimabasker -2012)**

Marti,A.,Z.Feng,H.J(2012) reported that as milk production increases, over-distention of the alveoli causes the milk-secreting cells to become flattened & occlude the capillary blood circulation surrounding the alveolar cells. Congestion contributes to edema, obstructs lymphatic drainage of the breasts, stagnating the system that rid the breasts of toxins, bacteria and leading to mastitis. In very severe cases can cause numbness or tingling of the Hands from pressure on the nerves. In addition, a protein called the feedback inhibitor of lactation accumulates in the mammary gland during milk stasis. It acts as a major trigger of apoptosis, that causes involution of the milk-secreting gland, collapse of the alveolar structures and the cessation of milk production.

Berens P. Academy of breastfeeding medicine protocol committee (2010) defines breast engorgement as **"**the swelling and distension of the breasts, usually in the early days of initiation of lactation, caused by vascular dilation as well as the arrival of the early milk .The common causes of engorged breasts are other feeds given to baby before starting breastfeeding, delayed starting of breastfeeds, long

intervals between feeds, early removal of the baby from the breast while breast feeding, bottle-feeding and any other restrictions on breastfeeding.

Foxman B, Schwartz K, Looman SJ (2009) conducted descriptive study on incidence of lactational mastitis, that they found lactational mastitis vary as low as 2% and up to 50%. Mastitis is an inflammation of the breast that is most commonly caused by milk stasis rather than infection. Non-infectious mastitis can usually be resolved without the use of antibiotics.

Glasgow (2009) Conducted a cross sectional study on effectiveness of milk removal and mastitis. They concluded "Without effective removal of milk, non-infectious mastitis was likely to progress to infectious mastitis, and leads to the formation of an abscess." Incidence of breast engorgement is 18%. In approximately 3% of those with mastitis and breast abscess may result in complication.

Auerback KG, Riordan J (2009) Conducted a descriptive study on the occurrence of breast engorgement. This study describe breast engorgement during day 1 to 14 of postpartum of first time vaginal delivery and second time caesarean section delivery breast feeding mothers. Most mothers reported experiencing their most intense engorgement after hospital discharge, previous breast feeding experience mother is more critical variables than the parity in predicting engorgement. Result showed that second time breast feeding mother experience engorgement sooner and more severely. The study conclude that exclusive breast feeding decrease the incidence of breast feeding problems.

Moon J, Humenick SS (2008) Conducted a descriptive study on "Breast Engorgement Patterns and Selected Outcomes", for 14 days following birth, 114 breastfeeding mothers rated their level of breast engorgement twice daily, using a six-point engorgement scale. Engorgement ratings are plotted by intensity over time to

provide a visual display of each subject's breast engorgement experience. They concluded that four distinct patterns of breast engorgement emerged; mothers experienced either a bell-shaped pattern, a multi-modal pattern, a pattern of intense engorgement, or a pattern of minimal engorgement.

2.2. Studies related to methods used in reducing breast engorgement

Stutte,P.C.,G.Y.Morman (2014) conducted an interventional studies on effectiveness of breast massage for breast engorgement. They concluded while nursing Gentle breast compressions and massage during the nursing session can reduce engorgement. After nursing for a few minutes to soften the breast, it may be possible to obtain a better latch by removing baby from the breast and re-latching.

Iffric,M.c. (2014) conducted a cross sectional study about infant feeding and milk expression between feedings. The study reveals that if the breast is uncomfortably full at the end of a feeding or between feedings, then express milk to comfort so that the breasts do not become overfull. Hand expression may be most helpful as this drains the milk ducts better. Mother might also use a Hand pump or a quality electric pump on a low setting for no more than 10 minutes.

McGraw-Hill Professional (2013) conducted an experimental study on effectiveness of anti-inflammatory drugs on breast engorgement. They found that after breast-feeding Take a non steroidal anti-inflammatory drug such as ibuprofen in addition to the non-medicine treatments. When taken as directed, ibuprofen is safe to use while breast-feeding. Try cold compresses. Apply a frozen wet towel, cold gel or ice packs, or bags of frozen vegetables to the breasts for 15 minutes at a time every hour as needed. To prevent tissue damage, do not apply cold to the bare skin. Place a thin cloth between the cold pack and the skin. Avoid constricting bras that press on

the breasts. A tight bra can reduce milk flow through the ducts, eventually causing blocked ducts.

Sherin Sara Eapen& Philomena Fernandes (2013) conducted a study about home remedial measure t**o** relieve breast engorgement. They suggested that engorgement can be included as a nursing procedure to provide care during postnatal mothers with breast engorgement and also to update the knowledge on evidence based practices. The nurse administrator initiates the midwives to practice the application of home remedial measures to relieve breast engorgement through in-service education and continuing education programmes and also prepare written policies/protocol about evidence based practice. The findings of the present study emphasize the management of breast engorgement with home remedial measures which can be put into nursing practice in relieving breast engorgement in postnatal mothers and encourage mothers to work with practical knowledge.

Kelly Bonyata, BS (2013) conducted a descriptive study about breast engorgement and infant latching. They found that it is normal for breasts to become larger and feel heavy, warmer and uncomfortable when the milk increases in quantity 2-5 days after birth. This rarely lasts more than 24 hours. With normal fullness, the breast and areola remain soft and elastic, milk flow is normal and latch-on is not affected Nurse early and often at least 10 times per 24 hours. Ensure correct latch and positioning so that baby is nursing well and sufficiently softening the breast. If baby is *not* nursing well, express milk regularly and frequently to maintain milk supply and minimize engorgement.

Treatment of breast engorgement includes support the breasts with a binder or brassiere, Manual expression of any remaining milk after each feed, to administer analgesics for pain, The baby should be put to the breast regularly at frequent

intervals. In severe case gentle use of breast pump may be helpful. This will reduce the tension in the breast without causing excess milk production. Prevention includes- avoid prelacteal feeds, feeding in correct position and to initiate breast feeding early and unrestricted.(**Dutta -2013)**

Shrivastav P, Kanagasabhapathy A (2012) Conducted on the efficacy of jasmine flowers to suppress puerperal lactation compared to Bromocripitine in Vellore India. Effectiveness of both regimens was monitored by clinical evaluation of the degree of breast engorgement and milk production. They concluded that jasmine flowers seem to be an effective and inexpensive method of suppressing puerperal lactation and managing engorgement.

Relief measures for breast feeding mothers includes carry out breast massage, manual expression and nipple rolling. Nurse the baby every 2- 3 hours without missing any feeding or using any supplements. Use both breasts at each feeding. Apply warmth to the breast prior to each breast feeding to promote milk flow. Manually express the milk if there is engorging of the areola to soften the area prior to nursing the baby. This will help the baby latch on to the nipple properly and easily. Use manual expression of milk to empty the breast after the baby has nursed if they are still uncomfortably full and engorged. Maintain good support to the breast without any pressure point. Icepack may be used between feedings to reduce swelling and pain. **(Annamma Jacob -2012)**

Arora S, Vatsa M, Dadhwal V (2012) Conducted a quasi experimental study on, " Comparison of Cabbage Leaves *versus* Hot and Cold Compresses in the Treatment of Breast Engorgement in the Post-Natal Ward of the All India Institute of Medical Sciences, New Delhi". The study was conducted on 60 subjects. They

concluded that cold cabbage leaves and hot and cold compress are equally effective in decreasing breast engorgement.

Green D, Moye L, Schreiner RL, Lemons JA.(2012) Conducted a Experimental study on effect of cabbage leaf extract on breast engorgement. By using a double-blind experiment with pre test / posttest design, 21participants received a cream containing cabbage leaf extract, while 18 received placebo cream. The two groups showing no difference on all outcome measures. Thus feeding had a greater effect than the application of cream on relieving discomfort and decreasing tissue hardness. It is therefore recommended that lactation consultant encourages mother to breast feeding if possible to relieve the discomfort of breast engorgement.

Humenick SS, Hill P, Anderson M.(2011) A randomized control trial to evaluate the effect of cabbage on mother's perception of breast engorgement and the influence of this treatment on breast feeding practices. The subject 120 breast feeding women72 hours postpartum were randomly allocated to an experimental group who receive application of cabbage leafs to their breast, or to control group who receive routine care. Result showed that at 6 weeks women who receive the cabbage leaf application were more likely to be breast feeding exclusively.

Hossain MA, Haque MI, Siddiqui AB, Bari MI (2010) Conducted a Study on total of 500 patients & about 95% mothers trained about correct technique of breast feeding in Bangladesh. Breast massage was given on an average of about 33% of attending mothers who suffered from different types of breast problems like engorged breast, sore nipple etc. For improving lactation & decreasing breast engorgement they were given breast massage. They concluded that most of the mothers required counseling, correction of position and some needed massage technique because of breast engorgement.

Evans K, Evans R, Simmer K (2009) Conducted an experimental study on the effect of breast massage on the subjective discomfort of mother. The subjects were 35 mothers & midwife measured breast engorgement using visual analogue scale rating from o-10. The breast skin surface temperature measurement was assessed by infrared thermometer after 1 mt ,3mt, and 5mt, after breast massage . They concluded that breast massage is good for blood circulation and is considered to be an effective way to ease the discomfort of breast engorgement.

Whitley N (2009) Conducted an experimental study to investigate the effectiveness of cold compress to the engorged breast of breast feeding mothers. By using convenience sampling technique 88 mothers were selected. 44 subjects were treated with cold packs. Mother in control group followed routine hospital procedure. Result showed that mother who were the cold packs experienced significantly less pain and significantly fewer sign and symptoms of breast engorgement at the end of the day than mothers who did not wear the cold packs.

2.3. Studies related to hand expression

Dawn Bernard (2014)conducted an experimental study on effectiveness of Hand expression on breast engorgement. Results showed that many women find that Hand expression is an efficient way to pump when only occasional expression is required. In fact, when colostrum is present and the milk production is not abundant it is often easier to get milk with Hand expression than with a pump and many women find this the easiest way to express mature milk.

Manual expression is advantageous over the mechanical pumping. It increases the level of prolactin which helps to maintain lactation for longer period. It can be practiced anywhere and costs nothing. Expression of breast milk or artificial removal of milk is not generally needed where breast is normal. The indication of expressing

breast milk are: where the baby is separated from the mother due to prematurity or illness, where there are difficulties in the breast feeding as in attaching the baby to the breast. e.g.cleft palate. When the mother is separated from the baby because of work. Colostrum should always expressed and given to the babies if they cannot suck properly. **(Dutta 2013)**

Rachael spencer., Kathryn hinsliff-smith Denis walsh (2013) conducted a study about educational intervention on breast engorgement. They suggested Antenatal education should focus more on preparing women for the realities of breastfeeding their newborn, and education on Hand expression and its benefits. There is a need to emphasize communication skills and techniques in breastfeeding training in addition to teaching positioning and attachment. After being discharged home, women should be contacted by their local peer support group representative. There is a need to explore other options such as breastfeeding peer supporters and other communication media to facilitate support for all mothers in this rural county.

Lawrence (2012) conducted a descriptive study to evaluate the effectiveness of Hand expression on breast complication. Hand expression, or the mother using her own Hands to physically remove the milk from the breast, has been overshadowed by recent developments of electric breast pumps that physically mimic the sucking action of the infant at the breast. Hand expression is an important part of breast care for the nursing mother if they emergently is separated from her infant or suddenly needs to remove milk from the breast. Hand expression is an invaluable skill, can easily be performed. This technique will often aid a mother to avoid overfill, preventing milk stasis, plugged ducts and mastitis.

Flahermanet *al. (*2012) conducted a study about the methods of removing the milk from the breast. They explain the steps in Hand expression are simple and easy

to follow. The breast should be massaged prior to expression to facilitate let-down. A warm compress placed onto the breast combined with circular breast massage will promote the milk ejection reflex. The mother should be in a comfortable, preferably upright position, holding an appropriate wide mouthed container. Instruct the mother to hold the breast in a 'C' shape with her Hand with her little finger toward the chest wall and thumb on top of breast. If the mother visualizes the ducts in the breast and uses the areola as a landmark, the process may be more successful. Instruct the mother to put her fingers and thumb behind the ducts on the border of the areola tissue. Press toward the chest wall and then gently push or roll her fingers forward toward the nipple propelling the milk out of the breast. The mother may find it helpful to press the fingers together, but not tightly, as she may bruise or damage the breast. Once the mother is successful with a few spurts of milk, she will get the feel of Hand expression. Keeping the Hands in the same position, pulsing the breast for a count of three and then releasing, helps to keep milk flowing. Once milk flow is slowing or decreasing, moving the mother's Hand around the breast in different positions will ensure most of the areas of the breast have been drained. Expressing the milk into a large, sterile, wide mouthed jar or container is easiest and avoids loss of milk from misdirected sprays. Hand expression in the early postpartum period may increase latter breastfeeding rates.

Science newshttp://www.sciencedaily.com/releases(2011). An interventional study was conducted to compare Manual Breast Milk Expression with Breast Pump for Poor Feeders**.** They base their findings on 68 mothers whose newborns were latching on to the nipple or sucking poorly 12 to 36 hours after birth. The mothers were randomly assigned to either 15 minutes of using a breast pump or 15 minutes of Manual Breast milk expression in a bid to encourage their babies to breastfeed.

Mothers who expressed manually said they were more comfortable being seen to do so than mothers who used a breast pump. And by the age of 2 months, breastfeeding rates were higher among those babies whose mums first expressed their breast milk by Hand than those who first used a breast pump. Almost all the mothers (97%) assigned to manual expression were breastfeeding compared with just under 73% of those assigned to the breast pump. Study concluded that Hand expression was more appropriate compared to breast pump.

Sinhababu A. et al., (2010) Conducted a cross-over study to investigate whether breast pumping using a hospital-grade electric pump was more effective in maximizing the available milk volume and more comfortable than manual expression in the first 48 hours after birth. Eleven women whose infants were admitted to the neonatal intensive care unit were sequentially allocated to either manual or electric breast expression for their first expression after 6 hours following birth. The women then used the other method for the next expression, and continued to alternate between methods until seven sessions had been completed for each method. Main outcome measure was volume of milk expressed per session. They concluded in the early postpartum period, the best way to obtain Colostrums' is by gentle manual expression.

Morton *et al.*,(2010)Conducted a descriptive study on the reduction of breast engorgement in the postpartam period and has discovered that even the most advance pumping technology available still allows significant volumes to remain in the breast in the first postpartum days. They suggests combining Hand expression with pumping or Hands on pumping. This technique encourages mothers to double pump initially, pumping both breasts together, and then as milk flow subsides, change to single pumping so that mothers can effectively massage while pumping. Once milk flow

ceases, turn the pump off and Hand express into the containers. Often mothers are able to significantly increase milk volumes with this technique. The Hand expression allows further removal of Hind milk.

3.4. Studies related to breast pump

Sarah Marshall.,Kirtly Jones (2015) from emedicinehealth medical reference, in their report if the baby becomes full before the breasts are empty, use a pump or use manual expression to squeeze the remaining milk from the breasts to store for later use. This is especially important during the early stages of breast-feeding. Early engorgement will decrease as breast-feeding becomes more routine and the baby is able to feed for longer periods of time. Anytime if the mother is not able to breast-feed to the baby, arrange for a time and place to manually express or pump milk from the breasts at least every 3 to 4 hours. Gently pump or use Hands to let out a small amount of milk. An automatic cycling breast pump with the suction adjusted to low is best for relieving engorgement or pump the breasts if the baby won't breast-feed. The mother can freeze pumped milk in clean containers or bags for later use.

There are several designs of breast pumps are available. Some pumps provide regular vacuum and release cycle, with variability in the strength of the suction. Some vary the frequency of the cycle as well some simpler models provide continuous suction, so that the mother has to take her finger off a whole to release it. The size of the breast cup may be the determinant of success and it is important to encourage the mother to experiment. Manually controlled breast pumps are not efficient enough to allow initiation of full lactation but they can be useful when expressing is necessary in well established lactation. It is helpful to mothers to explain that the pumps function most efficiently if the vacuum phase is considerably longer than the release phase.(**Myles -2014)**

SatishTiwari, Sudhir Mishra.(2014) Conducted a descriptive study to explore breastfeeding women's experiences of expressing breast milk. For milk banking, hospital grade electric pumps are preferred as they result in better volumes of expressed milks and are relatively painless and comfortable to use. There is no major difference in the types of electrical breast pumps. Manually operated breast milk pumps designed to operate more physiologically by simulating the infant's compressive action on the areola during breastfeeding can be used with lower cost implications.

Helene M Johns1, Della A Forster.(2014) conducted a study to evaluate the effectiveness of breast pump in expressing breast milk. Concurrently, breast pumps have evolved to be more sophisticated and aesthetically appealing, adapted for domestic use, and have become more readily available. In the past, expressed breast milk feeding was predominantly for those infants who were premature, small or unwell; however it has become increasingly common for healthy term infants.

Kentucky.(2013) Conducted a descriptive study to explore breastfeeding women's experiences of expressing breast milk. Hospital-grade breast pumps may be needed for high-risk mothers and babies to establish and maintain lactation during periods of extended separation or other medical problems. Personal breast pumps are appropriate for women who are breastfeeding well and also need to pump regularly during the day. These are often women who have returned to the workplace or to school. These pumps are also able to express both breasts simultaneously. Hand Pumps are appropriate for women who have a thriving, breastfed baby and wish to pump occasionally. They are also useful for providing short-term relief from engorgement or for pumping due to missed feedings.

Valerie J Flaherman, Newman-(2013) Conducted a Randomized controlled trial in Well-baby nursery and postpartum unit.68 mothers of newborns 12–36 hours old who were latching or sucking poorly were randomly assigned to either 15 min of bilateral electric pumping or 15 min of Hand expression. Measures Milk transfer, maternal pain, breastfeeding confidence and breast milk expression experience immediately after the intervention, and breastfeeding rates at 2 months after birth. They Concluded Hand expression in the early postpartum period appears to improve eventual breastfeeding rates at 2 months after birth compared with breast pumping.

NurAtiqahBintiRamlan(2013) conducted a descriptive study about the use of Manual Breast pump and milk expression. Women use breast pump to express breast milk which is later bottle fed to their child by a caregiver. A breast pump may also be used to stimulate lactation for women with a low milk supply. A breast pump may be used to reduce inflammation, a painful condition whereby the breasts are overfull, possibly preventing a proper latch by the infant. Manual Breast pumps are operated by squeezing or pulling a Handle in a recurring way, allowing the mother to directly control the pressure and frequency of milk extraction. Despite the fact that the Manual Breast pumps are small and inexpensive, they can require significant effort and can be tiring because the mother provides all the power. This style is recommended for occasional usage such as a working mother and also when a mother is away from her baby for a single feeding.

WHO/UNICEF(2012) The World Health Organization recommends that mothers be assisted to learn the skill of Hand expression before discharge from maternity services and that infants be fed exclusively on human milk from birth to six months of age. Children who do not receive human milk are more likely to suffer health problems. Mothers may also express milk for their own comfort if they have

sore nipples or engorgement; to increase milk supply; or to leave milk if away from their baby.

Bregram et al., (2012) conducted a descriptive study about the common reason for use of breast pump. Result showed that most of the working mothers have insufficient time and that makes the breastfeeding becomes very hard to perform and mothers cannot maintain their milk supply to their infants. In consequence, the best solution to overcome this problem is by using the breast pump. There is also some common reason of why the mothers use a breast pump such as to stimulate their milk production when they are unable to nurse their infant after birth. A breast pump allows mother to store milk in bottles or storage bags for later, and then bottle-feed it to baby or mix a little cereal when he or she reaches the solid food stage. Mothers can refrigerate breast milk safely for five to seven days, or freeze it for up to a year.

Yvonne CNM(2011) Conducted a Study on the management of postpartum breast engorgement in breast feeding women by mechanical extraction of milk. Minimal engorgement was experienced by 46% of the subjects. A control group (n=33) who experienced breast engorgement & followed standard management practice was compared to an experimental group (n=34) who used a Hand operated pump to relieve engorgement symptoms. They suggested that mechanical removal of milk is an effective way to increase the comfort & decrease the symptoms of engorgement.

Meserve, Y(2011) An experimental study to test the effectiveness of milk removal as a method of reducing the discomfort of postpartum breast engorgement in non breastfeeding women. The course of breast involution was followed in 13 women. Minimal engorgement was experienced by 46% of the subjects. A control group (N = 3) who experienced engorgement and followed standard management

practice was compared to an experimental group (N = 4) who used a Hand-operated pump to relieve engorgement symptoms. The subjects in the experimental group experienced a shorter, more comfortable course of breast involution, the results suggest that mechanical removal of milk is an effective way to increase the comfort and decrease the symptoms of engorgement in women who do not breastfeed their infants.

Vinod k. Paulurmiltaneja(2010) Conducted a study designed to compare two methods of breast milk expression, namely, the manual and the pumping method using a Hand-held cylindrical pump. The use of breast pump is more efficient than the manual system of expression of breast milk among mothers whose infants are not directly breast-fed. It is recommended that in case the mothers prefer to use the manual method, let them express as much milk as possible by this method initially, and then follow it up with a short period of pumping to ensure complete evacuation of breasts.

2.5. CONCEPTUAL FRAMEWORK

A framework is a brief explanation of theory or those portions of a theory which are to be tested in a quantitative study. A conceptual framework is one that presents logically constructed concepts to provide general explanation of relationship between the concepts of the research study; they are usually constructed by using researcher's own experiences, previous research findings, or concepts of several theories or models. Conceptual framework facilitates communication and provides for a systemic approach to nursing research, education, administration and practice.

The conceptual framework selected for this research study was based on J.W Kenny's Open System Model. All living organisms are open that, there is a continual exchange of matter, energy and information. Open system has varying degrees of interaction with environment, from which the system receives the input and gives back output in the form of matter, energy and information. The three major aspects of the systems are:

- **Input**
- **Throughput**
- **Output**

Input is any type of information, energy and material that enters the systems from environment through its boundaries. In this study it refers to pre assessment of breast engorgement by using 6 point Lactation Consultant scale and Storr scale and obtaining demographic variables from self structured questionnaire among post natal mother with breast engorgement.

Throughput is that any information, energy or material that is given to the postnatal mother with breast engorgement. In this study, the throughput includes the transformation of knowledge regarding prevention of breast engorgement and the

management of breast engorgement includes expression of breast milk with the use of closed system manual breast pump for group-I and Hand expression to group-II and the assessment of breast engorgement after intervention by using 6 point Lactation Consultant scale and Storr scale.

Output is the information that leave the system, and enters the environment through the system. In this study it refers to relief of pain and discomfort of breast engorgement, and comparison of Manual Breast pump and Hand expression.

The feedback refers to the environmental responses to the system output. Depends on the output which is either may be reinforcement or enhancement.

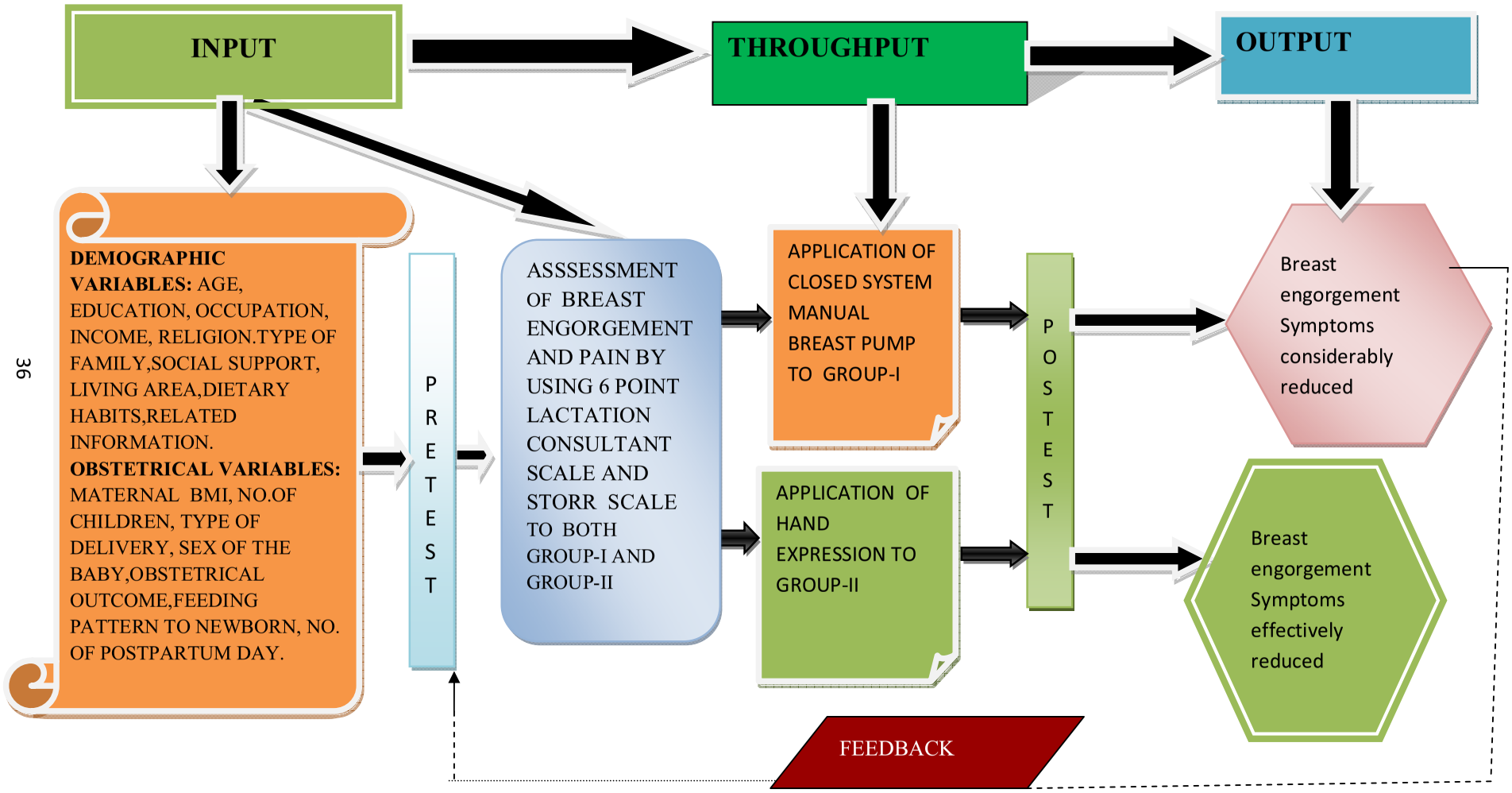


Fig.1.CONCEPTUAL FRAME WORK BASED ON MODIFIED J.W.KENNYS OPEN SYSTEM MODEL-1991.

RESEARCH METHODOLOGY

CHAPTER- III

RESEARCH METHODOLOGY

Research methodology is the overall plan for addressing the research problem and it covers multiple aspects of study's structure. It acts as a guide for planning, implementation and analysis of the study. It includes the descriptions of the research approaches, research design dependent and independent variables, sampling design, description of the tool, pilot study, and a planned format for data collection and a plan for data analysis.

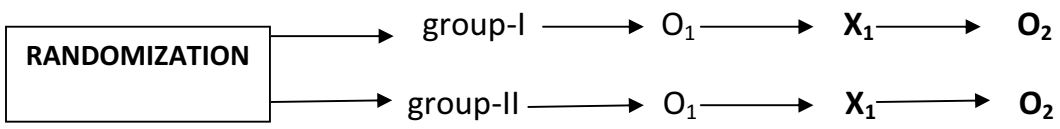
This chapter deals with the methodology to evaluate the effectiveness of closed system Manual Breast pump versus Hand expression on breast engorgement among postnatal mothers admitted at Government Rajaji hospital, Madurai.

3.1 RESEARCH APPROACH

Quantitative research approach was used in this study.

3.2 RESEARCH DESIGN

The research design for this study is true-experimental comparative research design.



KEY:

O_1- Pre assessment of breast engorgement (Using 6point breast engorgement scale and Storr Scale.)

X_1- Intervention of Manual Breast pump for the group-I

X_2- Hand expression for group-II.

O_2 - Post assessment of breast engorgement after intervention.

3.3 RESEARCH VARIABLES

Independent variable: closed system Manual Breast pump, Hand expression

Dependent variable: Breast engorgement

Socio demographic variable: age, education, occupation, income, religion, type of family, social support, living area, dietary habits and related information.

Clinical variable: maternal BMI, No of children, type of delivery, sex of baby, obstetrical outcome, feeding pattern to new born, No of post partum day.

3.4 SETTING OF THE STUDY

The setting was selected based on acquaintance of the investigator with the institution, feasibility of conducting the study, availability of the sample, permission and proximity of the setting to investigation. The study was conducted in postnatal ward and cesarean postoperative ward in Government Rajaji Hospital, Madurai. At present there are about 2518 beds available in Multi Speciality Medical College attached Hospital and it provides a comprehensive care to all. As per the month of December 20015 statistics Department of Obstetrics and Gynaecology consists of 650 beds. Total number of delivery per month is approximately 1084.In which normal deliveries per month is 455,Cesarean section is 594,forceps delivery-28, new born admission is 154.

3.5 POPULATION

TARGET POPULATION

All postnatal mothers with breast engorgement.

Accessible population:

The postnatal mothers with breast engorgement admitted in post natal ward at Government Rajaji Hospital, Madurai.

Sample

Post-natal mothers with breast engorgement admitted in post natal ward at Government Rajaji Hospital, Madurai and those who met the inclusion criteria.

3.6 Sample size

Total sample size is 60.Thirty samples for group-I and 30 samples for group-II.

3.7 Sampling technique

Sample refers to the process of selecting a portion of the population which refers the entire population. The subjects were selected by probability – simple random sampling techniques by using the lottery method.

The sample were selected those who met the inclusion criteria, by the use of lottery method and then with the use of flip of coin method, the group was assigned.

3.8 Criteria for sample selection

Inclusion criteria:

- ❖ Post natal mothers with breast engorgement
- ❖ Post natal mothers those who were willing to participate in study.
- ❖ Post natal mothers those who can speak and understand Tamil or English

Exclusion criteria

1. The postnatal mothers who are breast feeding normally
2. Post natal mother who's baby died after birth and receiving lactation suppressants

3.9 Development & Description of tool:

The tool was developed and standardized from extensive review of literature, internet research and discussion with experts.

Research tool:

The tool used for this study is 6 point Lactation Consultant scale and Storr scale.

Description of the tool:

The tool consists of two parts

Section-I:

Part-A Socio demographic data consists of age, education, occupation, income, religion, type of family, social support, living area, dietary habits and related information.

Part –B

Consist of maternal BMI, No of children, type of delivery, sex of baby, obstetrical outcome, feeding pattern to new born, No of post partum day.

Section- II

Consists of observational check list for signs and symptoms of breast engorgement.6 point Lactation Consultant scale and Storr scale.

- **6 point Lactation Consultant scale**

SCORE	DESCRIPTION
1	Soft, No change in breasts
2	Slight change in breasts
3	Firm, Non-tender breasts
4	Firm, beginning tenderness in breast
5	Firm, Tender
6	Very firm, Very tender

- **Storr scale:** Storr (1988) scale will be used to assess the level of breast engorgement and intensity of pain before and after intervention.

Description of the tool:

SCORE	DESCRIPTION
0	Normal as in pregnancy and no pain.
1	Breast beginning to feel full and mild pain.
2	Breast heavy and slightly warm and moderate pain.
3	Breast warm and heavy and severe pain.
4	Breast very hard and worst pain.

3.10. Testing of the tool

Validity

Validity of the tool was given to experts from the field of obstetrics, medicine, nursing, and for their opinion and suggestion. Based on their valuable suggestions, reframing of tool was done and also validity was established. The content validity of the tool was ascertained by the expert's opinion in the following field experience- Obstetrician – 2,Pediatrician – 1and the Obstetric nurse specialist – 3.Addition or modification that was suggested by the experts was incorporated in the tool. All the experts have their consensus and then the tool was finalized.

Reliability

The reliability of measuring tool is a major criterion in assessing the accuracy. The reliability was assessed by split half method (o.86).the reliability test score shows there is a stability and consistency in the tool items. Hence the tool was considered highly reliable for proceeding the study.

3.10 Pilot study

In order to test the relevance and practicability of the study. A Pilot study was conducted among 10 subjects. A formal permission was obtained from institutional review board/ethical committee and obstetrical and gynecological department, Government Rajaji Hospital, Madurai. The pilot study was conducted at above department for a period of 7 days from 01/06/15 to 07/06/15. About 10 postnatal mothers with breast engorement,5 subject for group-I and 5 for group-II were selected for this study. The subjects were selected by probability – simple random sampling techniques by using the lottery method and by flip of coin method the group was assigned. Intervention with breast pump to group-I and Hand expression to group-II. The study was practically feasible to be conducted with a larger sample size.

3.11 Procedure for data collection

The formal permission was obtained from the Institutional review board/Independent ethical committee and OBG department of government Rajaji Hospital, Madurai-20. The data collection was done for a period of 4 weeks from 03.08.2015 to 13.09.2015.The researcher first introduced herself and had a general talk with all postnatal mother who fulfilled the inclusion criteria and selected sixty samples by simple random sampling technique and explained the purpose of the study and got written consent from all subjects who took part in study and the subjects were reassured regarding confidentiality.

3.12 Intervention:

In this study researcher uses the closed system manual breast pump to experimental group I and Hand expression to group-II. Intervention is three times a

day at three hours interval. Duration of intervention per subject is twenty minutes, ten minutes for each breast. post test was done after the three intervention in same day.

Step 1: The groups was randomly assigned into two groups. Group I: Samples who will receive the intervention of Closed System Manual BreastPump application. Group II: Samples who will receive the intervention of Hand expression.

Step 2: The level of breast engorgement was assessed with the help of 6 point Lactation Consultant scale and Storr scale for both group I and group II before and after the intervention.

Step 3: For group I closed system Manual Breast pump applied to the breast for 20 minutes with 3 applications at 3 hours interval and for group II Hand expression done for 20 minutes with 3 applications at 3 hours interval.

Step 4: For group I the level of breast engorgement assessed by using Internationally Board Certified Lactation Consultant scale and Storr scale after 3rd application of closed system Manual Breast pump and for group II the level of breast engorgement was assessed by using the same scale after 3rd application of Hand expression.

3.13 Plan for data analysis:

The data collected to be subjected to statistical analysis using descriptive and inferential statistics methods of mean frequency distribution, standard deviation, chi-square test and independent 't' test.

Descriptive statistics:

1. Frequency and percentage distribution was used to analyze the Baseline variable of postnatal mothers.
2. Mean and standard deviation was used to analyze the pretest and post test level of breast engorgement among postnatal mothers.

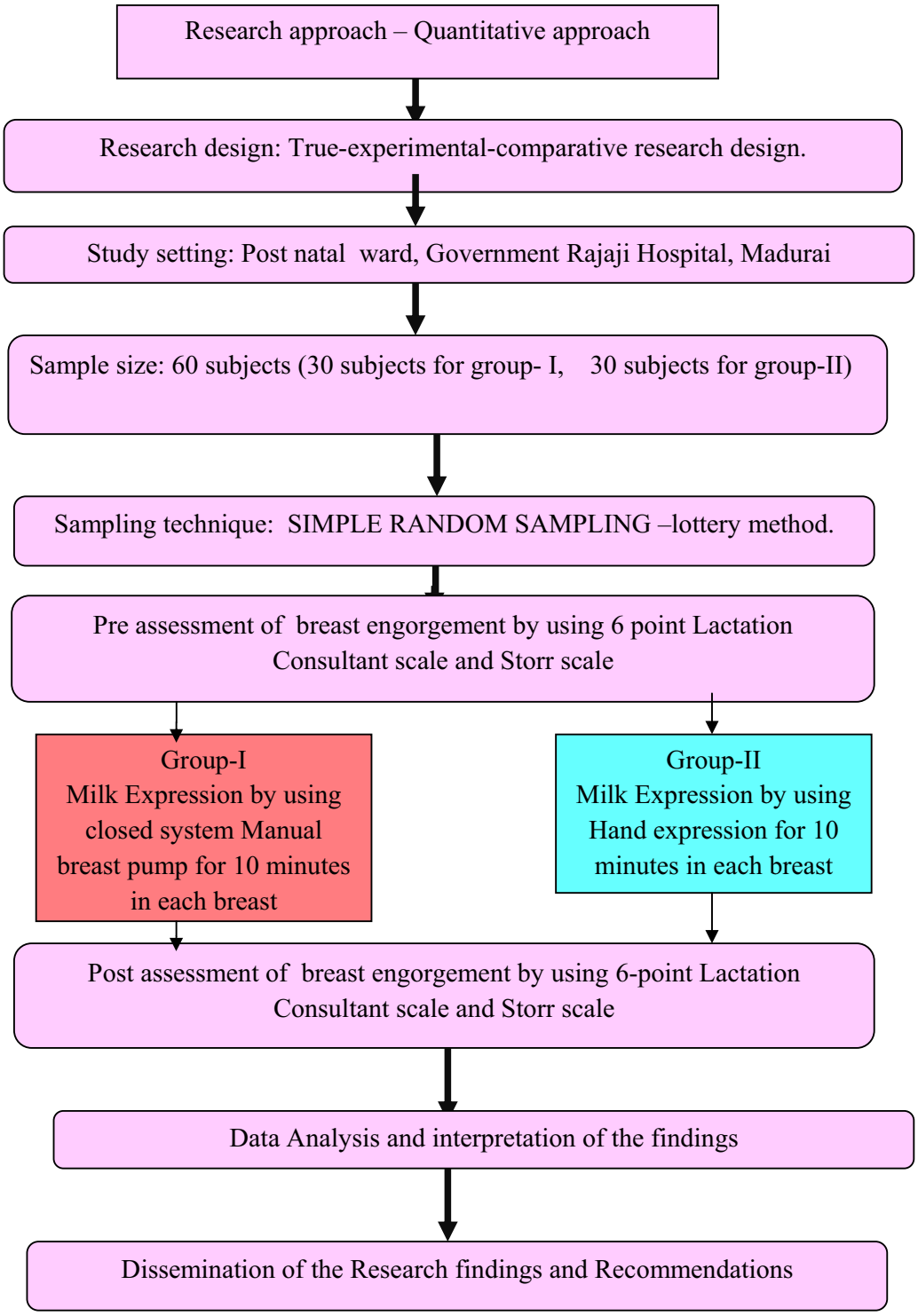
Inferential statistics:

1. Paired ‘t’ test was used to compare pretest and post test level of breast engorgement.
2. Karl Pearson’s Correlation was used to find out the relationship between group-I and group-II.
3. Chi-square test was used to find out the association of posttest level of breast engorgement with selected Baseline variables

3.14 Protection of human rights

The investigator obtained approval from dissertation committee, The Government Rajaji Hospital ethical committee, and formal written permission from the OBG department. Each individual client was informed about the purpose of the study and confidentiality was promised and ensured. Both verbal and written consent was obtained from all the study subjects and data collected was kept confidential. The names of the subjects were not disclosed in any form. The client had freedom to leave the study at her will without assigning any reason. Anonymity was maintained throughout the study.

SCHEMATIC REPRESENTATION OF RESEARCH DESIGN



DATA ANALYSIS

AND

INTERPRETATION

CHAPTER - IV

DATA ANALYSIS & INTERPRETATION

This chapter deals with the analysis and interpretation of data which was collected as an attempt to find out the effectiveness of closed system Manual Breast pump versus Hand expression on breast engorgement among postnatal mothers in Government Rajaji Hospital, Madurai.60 samples were selected for this study. Assessment of breast engorgement was done with the help of 6 point lactation consultant scale and Storr scale. Statistical procedure enabled the investigator to deduce, summarize, organize, evaluate, interpret and communicate the numeric information. In this chapter the data collected were edited, tabulated, analyzed and interpreted.

The data collected were organized under the following sections

SECTION I: Distribution of mothers according to their socio- demographic characteristics.

SECTION II: Distribution of mothers according to their obstetrical variables.

SECTION III: Description of breast engorgement among postnatal mothers of Group- I and Group-II with the use of 6 point lactation consultant scale and Storr scale.

SECTION IV: Effectiveness of closed system Manual Breast pump to Group-I and Hand expression to Group-II on breast engorgement among post natal mothers.

SECTION V: Comparison of the breast engorgement score between group I and group II among post natal mothers.

SECTION VI: Association between post test level of breast engorgement score with their selected socio - demographic and obstetrical variables.

Section-I

Distribution of mother according to socio demographic variables

Table 1

Frequency and percentage distribution of socio- demographic variable

n=60

Demographic variables		Group				Total
		group-1 (Breast pump) (n=30)		group- II (Hand expression) (n=30)		
		f	%	f	%	
Age in years	15 -20 years	3	10.0%	5	16.7%	8
	21 -25 years	14	46.7%	11	36.6%	25
	26 -30 years	11	36.6%	12	40.0%	23
	> 30 years	2	6.7%	2	6.7%	4
Education	Primary	21	70.0%	23	76.7%	44
	Degree	4	13.3%	4	13.3%	8
	Higher secondary	5	16.7%	3	10.0%	8
Occupation	Home maker	13	43.3%	16	53.3%	29
	Private worker	11	36.7%	8	26.7%	19
	Cooly worker	6	20.0%	6	20.0%	12
Income	Rs.5001 to 10,000	26	86.7%	25	83.3%	51
	Rs.10001 to 15,000	4	13.3%	5	16.7%	9
Religion	Hindu	27	90.0%	26	86.7%	53
	Muslim	1	3.3%	3	10.0%	4
	Christian	2	6.7%	1	3.3%	3

Socio- demographic variables		f	%	f	%	Total
Type of family	Nuclear family	17	56.7%	17	56.7%	34
	Joint family	12	40.0%	12	40.0%	24
	Extended family	1	3.3%	1	3.3%	2
Social support	Husband	21	70.0%	20	66.6%	41
	Friends and Neighbours	6	20.0%	5	16.7%	11
	Relative	3	10.0%	5	16.7%	8
Living area	Urban	11	36.7%	17	56.7%	28
	Rural	19	63.3%	13	43.3%	32
Dietary habits	Non vegetarian	30	100.0%	30	100.0%	60
Related information	No previous information	24	80.0%	20	66.7%	44
	Health personal	1	3.3%	2	6.7%	3
	Friends	1	3.3%	4	13.3%	5
	Family members	4	13.4%	4	13.3%	8

The above table- 1 shows the distribution of subjects according to their socio-demographic variables.

When comparing **age group**, in group-1,majority of women 14 (46.7%) belongs to the age group between 21-25 years, 11 (36.6%) belonged to the age group of 26-30 years,3(10%)belong to 15-20 years of age group and 2 (6.7%) is above 30 years. whereas in the group-II, women in the age group of 26-30 years 12 (40%),

the age group between 21 – 25 years 11 (36.6%) and the age group of 15 – 20 years is 5 (16.7).and 2(6.7%) were above 30 years.

Regarding **educational status**, in the group-1, 21 (70%) had studied up to primary level education, 5 (16.7%) had studied up to higher secondary level, and the remaining 4 (13.3%) were graduate and above. In group-II, 23 (76.7%) had studied up to primary level, 4 (13.3%) had studied up to Degree level, 3 (10%) had higher secondary education.

Regarding **occupation**, in group-I, 13 (43.3%) were home maker, 11 (36.7%) were private employees, 6 (20%) were coolie workers. 2. But in the group-II, majority of them 16 (53.3%) were home maker, 8 (26.7%) were private employees, 6 (20%) were coolie workers.

Based on their **family income** majority in the group-I, 26 (86.7%) earned an income between Rs.5001- Rs.10,000,and 4 (13.3%) earned an income between Rs.10,001- Rs.15,000. Whereas in the group-II, majority of them 25 (83.3%) earned an income between Rs.5001- Rs.10,000, and 5 (16.7%) earned an income between Rs.10,001- Rs.15,000.

Related to **religion** in group-I, majority 27 (90.0%) were Hindus, 2 (6.7%) were Christians, and 1 (3.3%) Muslim. Whereas in the group-II, Hindus were 26 (86.7%), and the remaining 3(10%) were Muslims, and 1 (3.3%) Christian.

Regarding **type of family**, in group-1 majority of them 17 (56.7%) from nuclear family, 12 (40%) from joint family, 1 (3.3%) from extended family. And in the group-II, majority of them 17 (56.7%) from nuclear families, 12 (40.0%) from joint family, 1 (3.3%) from extended family.

About their **social support** in group-1, 21(70%) women get support from their husband,6(20%)from friends and neighbors, and 3(10%) get support from their

relative. In group-II, majority 20(66.6%) women get support from their husband,5(16%) were from friends and neighbors and 5(16%) from their relative.

Regarding **living area** 19(63.3%) from rural and 11(36.7%) from urban in group-I. Where as in Group-II, majority 17(56.7%) from urban and 13(43.3%) from rural areas.

When identifying the **dietary habits** all subject in the group-I and group-II were non vegetarian.

According to **previous sources of information** regarding breast milk expression in the group-I majority 24(80.0%) of the women did not receive any information, 4 (13.3%) of the women received information from their family members. 1 (3.3%) received information from health personnel and friends. Whereas in the group-II, 20(66.7%) of the women did not receive any information.4 (13.3%) of them received information from friends and family members and 2(6.7%) of them received information from their family members.

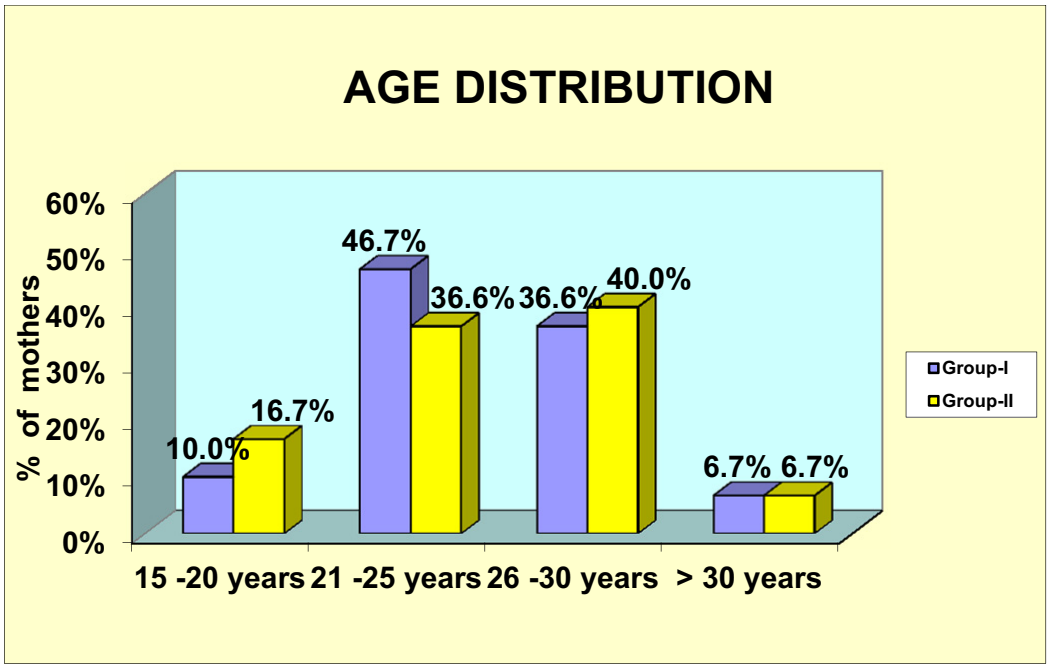


Figure 1,Bar diagram shows the distribution of subject according to age

The above bar diagram quotes that in the group-1,majority of women 14 (46.7%) belongs to the age group between 21-25 years, 11 (36.6%) belonged to the age group of 26-30 years,3(10%)belong to 15-20 years of age group and 2 (6.7%) is above 30 years. whereas in the group-II women in the age group of 26-30 years 12 (40%), the age group between 21 – 25 years 11 (36.6%) and the age group of 15 – 20 years is 5 (16.7).and 2(6.7%) were above 30 years.

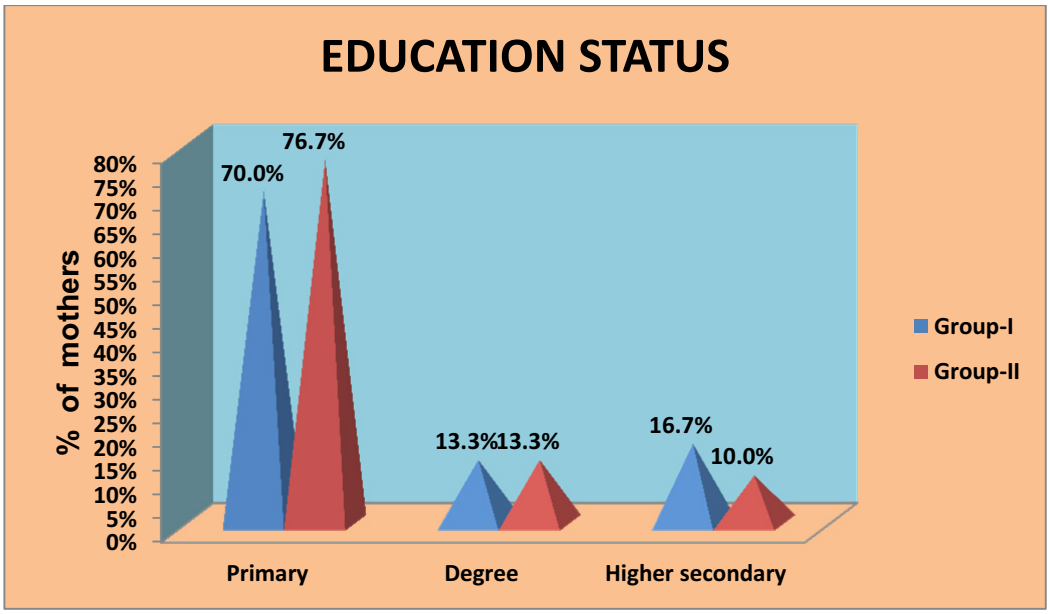


Figure-2, Pyramid diagram shows the Distribution of subjects according to educational status

The above pyramid diagram identifies that in group-I, 21 (70%) had studied up to primary level education, 5 (16.7%) had studied up to higher secondary level, and the remaining 4 (13.3%) were graduate and above. In group-II, 23 (76.7%) had studied up to primary level, 4 (13.3%) had studied up to Degree level, 3 (10%) had higher secondary education.

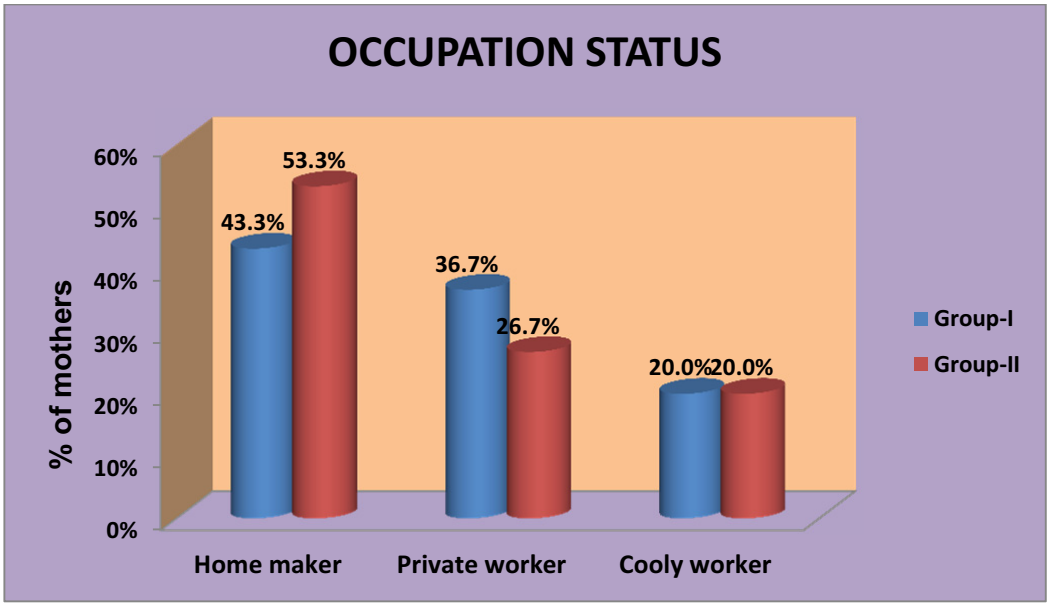


Figure 3, Cylinder diagram shows distribution of subjects according to their ocupational status

The above cylinder diagram reveals that in group-I, 13 (43.3%) were home maker, 11 (36.7%) were private employees, 6 (20%) were coolie workers. 2. But in the group-II, majority of them 16 (53.3%) were home maker, 8 (26.7%) were private employees, 6 (20%) were coolie workers.

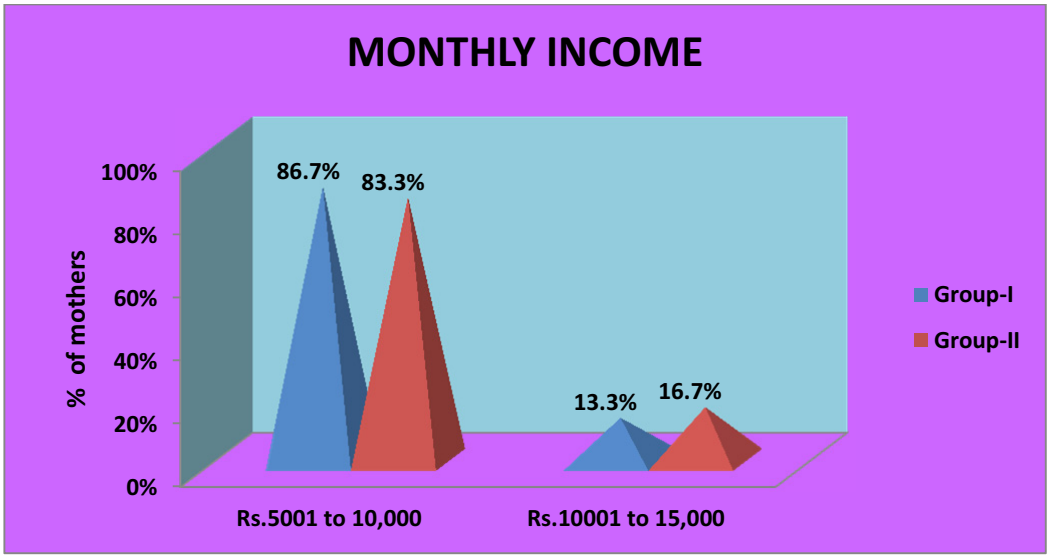


Figure- 4 Pyramid diagram illustrates distribution of subjects according to monthly Income

The above pyramid diagram mentions that in group-I, majority, 26 (86.7%) earned an income between Rs.5001- Rs.10,000, and 4 (13.3%) earned an income between Rs.10,001- Rs.15,000. Whereas in the group-II, majority of them 25 (83.3%) earned an income between Rs.5001- Rs.10,000, and 5 (16.7%) earned an income between Rs.10,001- Rs.15,000.

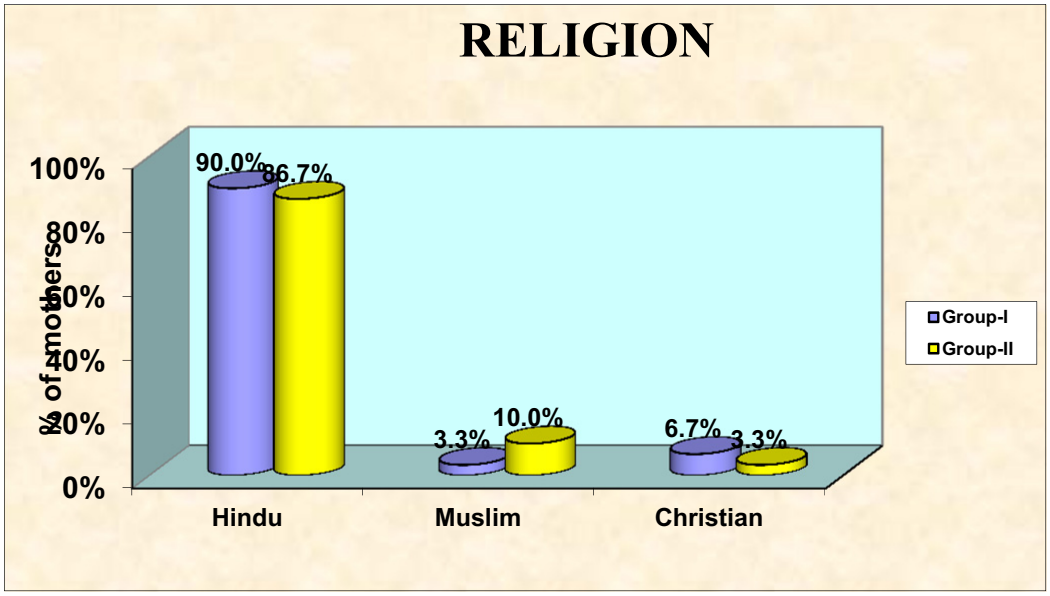


Figure-5, Cylinder diagram shows distribution of subjects according to Religion

The above cylinder diagram depicts that in the group-I, majority 27 (90.0%) were Hindus, 2 (6.7%) were Christians, and 1 (3.3%) Muslim. Whereas in the group-II, Hindus were 26 (86.7%), and the remaining 3(10%) were Muslims, and 1 (3.3%) Christian.

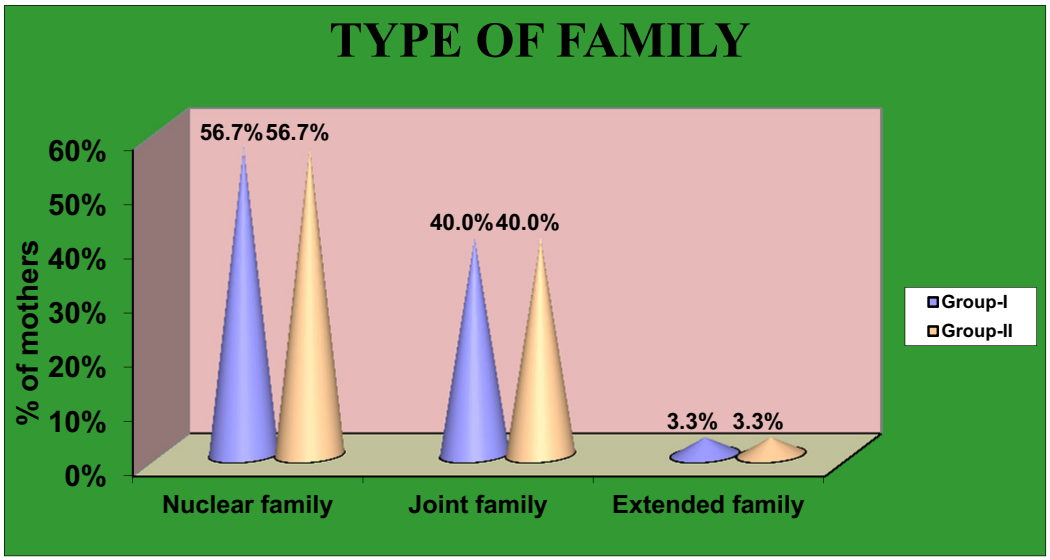


Figure-6, Multiple Cone diagram showing distribution of subjects according to their type of family

The above cone diagram explains that in the group-1 majority of them 17 (56.7%) from nuclear family, 12 (40%) from joint family, 1 (3.3%) from extended family. And in the group-II, majority of them 17 (56.7%) from nuclear families, 12 (40.0%) from joint family, 1 (3.3%) from extended family.

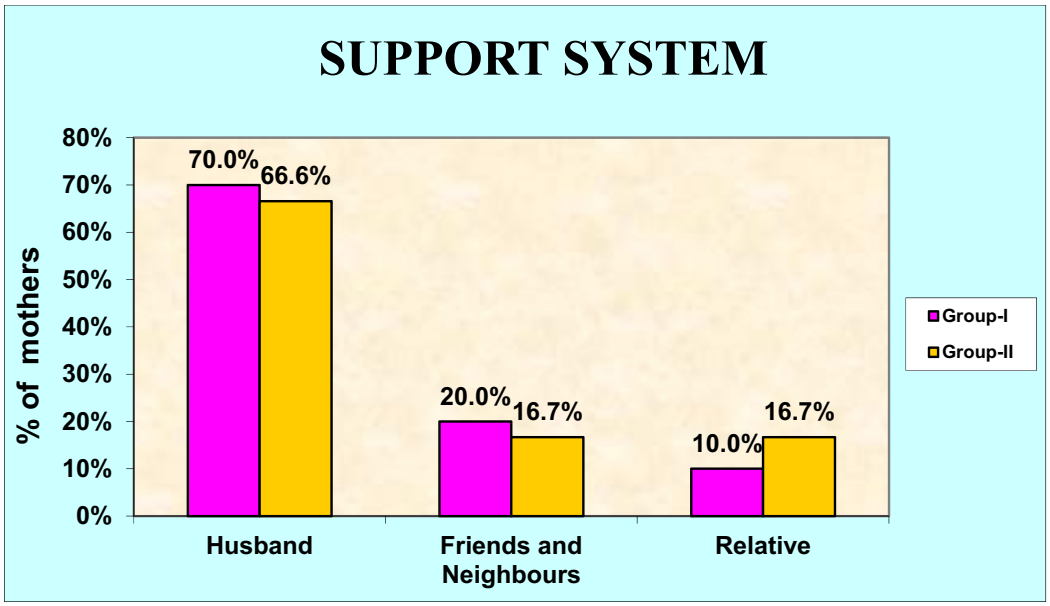


Figure- 7, Bar diagram showing distribution of subjects according to their support system

The above bar diagram identifies that in group-1, 21(70%) women get support from their husband,6(20%)from friends and neighbors, and 3(10%) get support from their relative. And in group-II, majority 20(66.6%) women get support from their husband,5(16%) were from friends and neighbors and 5(16%) from their relative.

AREA OF RESIDENCE

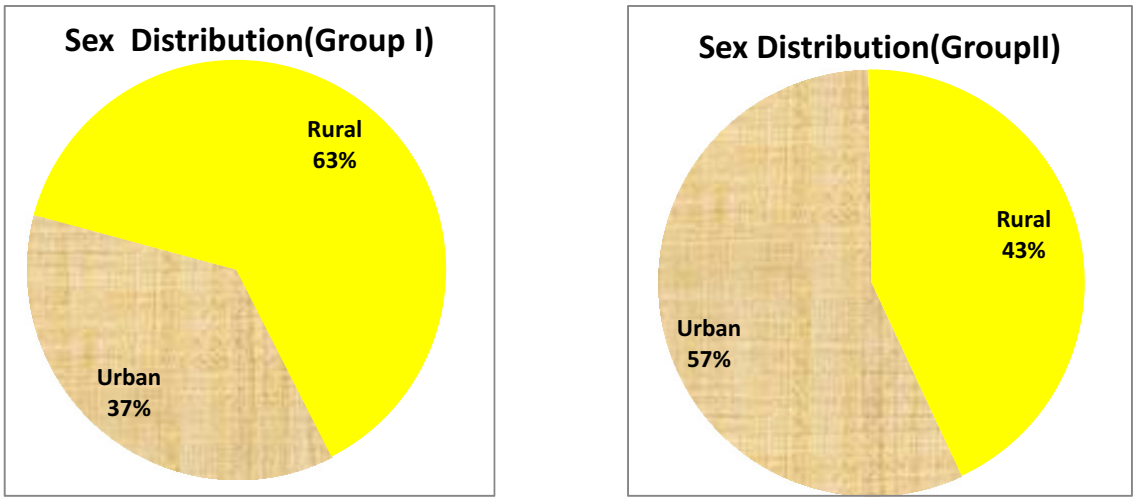


Figure-8, pie diagram showing distribution of subjects according to their area of residence

The above pie diagram exhibits that in the group-I, majority of women 19(63.3%) from rural and 11(36.7%) from urban. Whereas in Group-II, majority 17(56.7%) from urban and 13(43.3%) from rural areas.

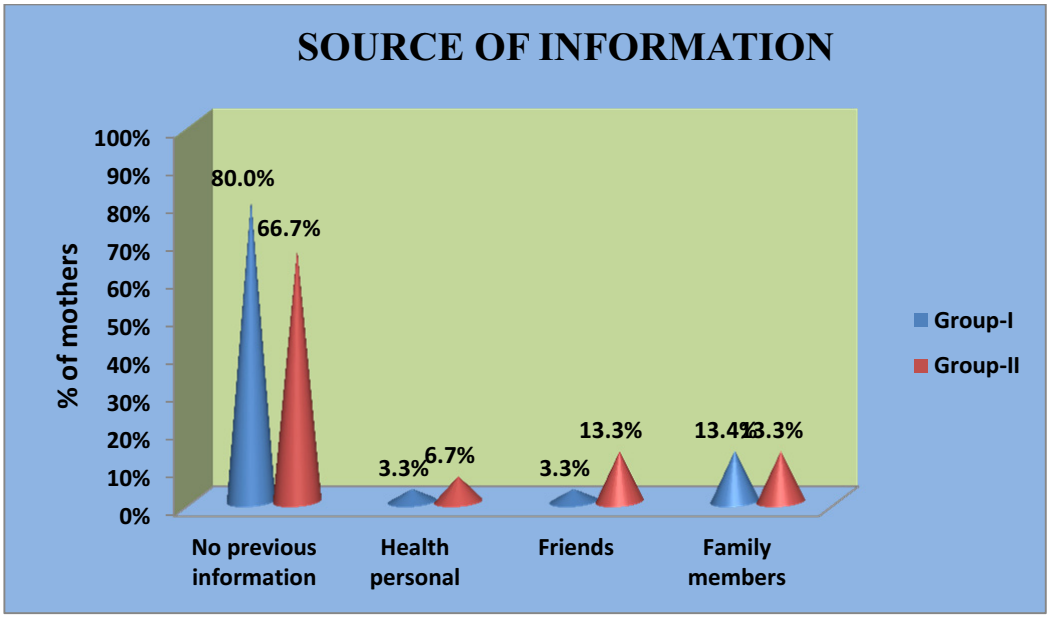


Figure-9, **Cone diagram shows distribution of subjects according to the previous sources of information regarding breast milk expression**

The above cone diagram mention that in the group-I, majority 24(80.0%) of the women did not receive any information, 4 (13.3%) of the women received information from their family members. 1 (3.3%) received information from health personnel and friends. Whereas in the group-II, 20(66.7%) of the women did not receive any information.4 (13.3%) of them received information from friends and family members and 2(6.7%) of them received information from their family members.

SECTION-II

Distribution of mothers according to obstetrical variables

TABLE 2

Frequency and percentage distribution of obstetrical variables

n=60

Obstetrical variables		Group				Total
		group I(n=30)		Group II(n=30)		
		f	%	f	%	
Mother's BMI	18.6 - 25.0	12	40.0%	17	56.7%	29
	25.1 - 30.0	18	60.0%	13	43.3%	31
No of children	One	25	83.3%	24	80.0%	49
	Two	5	16.7%	6	20.0%	11
Type of delivery	Normal vaginal delivery	12	40.0%	19	63.4%	28
	LSCS	16	53.3%	10	33.3%	29
	Forceps Delivery	2	6.7%	1	3.3%	3
Sex of baby	Male	15	50.0%	15	50.0%	30
	Female	15	50.0%	15	50.0%	30
Obstetrical outcome	Preterm Baby	3	10.0%	3	10.0%	6
	IUGR Baby	5	16.6%	8	26.6%	13
	Congenital anomaly	2	6.7%	2	6.7%	4
	Healthy baby	5	16.7%	2	6.7%	7
	Others	15	50.0%	15	50.0%	30
Feeding pattern	Expressed breast Milk	20	66.7%	20	66.7%	40
	Tube feeding	10	33.3%	10	33.3%	20
No. of post partum days	5-10 days	6	20.0%	8	26.7%	14
	11 -15 days	8	26.7%	2	6.6%	10
	16 - 20 days	9	30.0%	12	40.0%	21
	> 20 days	7	23.3%	8	26.7%	15

Table 2 shows the distribution of demographic characteristics among postnatal mothers with breast engorgement.

When comparing the **mothers BMI** in group-1,BMI-25.1-30 their frequency is 18 (60%)and the BMI-18.6-25 the frequency is 12(40%).In group-II, majority 17(56.7%) were in BMI-18.6-25.and 13(43.3%)were in 25.1-30 BMI.

While considering the **number of children** among group-I, majority of them 25(83.3%) had one child,5(16.7%) had two children. When compared to group-II, majority 24(80%) had one child and 6(20%) had two children.

When identifying the **type of delivery** in group-I, majority 16(53.3%) were in LSCS,12(40%) were in normal delivery and 2(6.7%) were forceps delivery. In group-II, majority 19(63.4%) were in normal vaginal delivery and 10(33.3%) were in forceps delivery.

Regarding **sex of the baby,** in group-I, both male and female baby frequency 15(50%), whereas in the group-II both male and female babies frequency was 15(50%).

While considering the **obstetrical outcome** in group-I, majority of mother's babies 15(50%) were suffered from other illness, IUGR 5(16.6%), healthy babies 5(16.7%) and preterm birth 3(10%), babies with congenital anomaly were 2(6.7%). In group-II, babies suffered from other illness were 15 (50%), preterm birth 3(10%),IUGR 5(16.6%),congenital anomaly 2(6.7%),and healthy babies were 2(6.7%).

When comparing the **milk expression data** in group-I, and group-II, infant feeding through expressed breast milk were 20(66.7%) and tube feeding were 10(33.3%).

Regarding the **number of post partum days** in group-I, mothers 9(30%) were in 16-20thpost operative days, more than 20 days 7(23.3%),mothers 8(26.7%) were in 11-15th days, and 5-10th days were 6(20%).In group-II, majority 12(40%) were in 16-20thpost operative days, more than 20th and 5-10 post operative days mothers were 8(26.7%) and mothers 2(6.6%) were in 11-15thpost operative days.

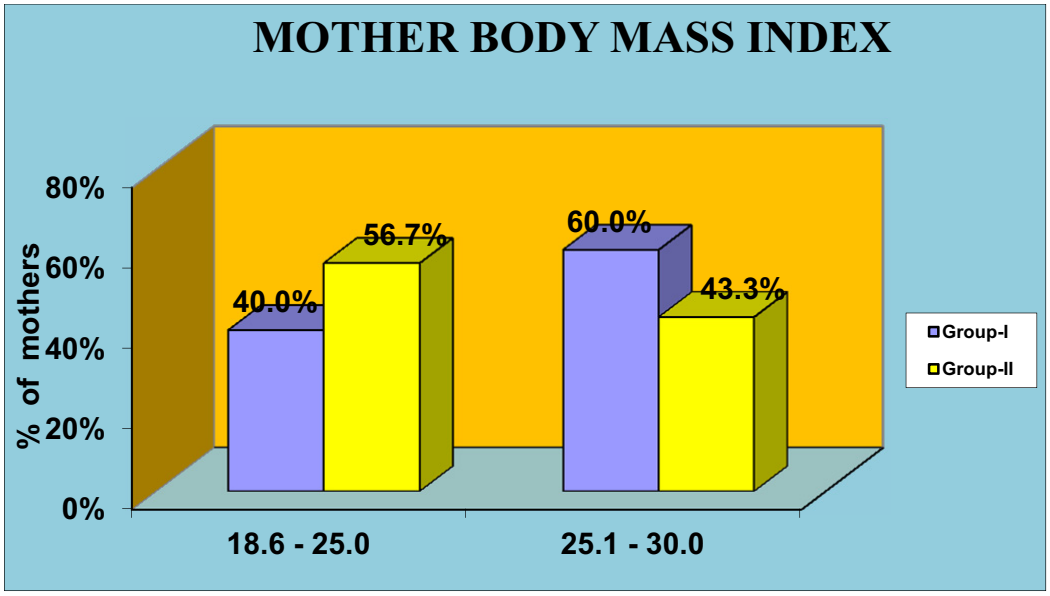


Figure-10, Multiple Bar diagram showing distribution of subjects according to the mothers body mass index

The above bar diagram portrays that in group-1,BMI-25.1-30 their frequency is 18 (60%)and the BMI-18.6-25 the frequency is 12(40%). In group-II, majority 17(56.7%) were in BMI-18.6-25.and 13(43.3%)were in 25.1-30 BMI.

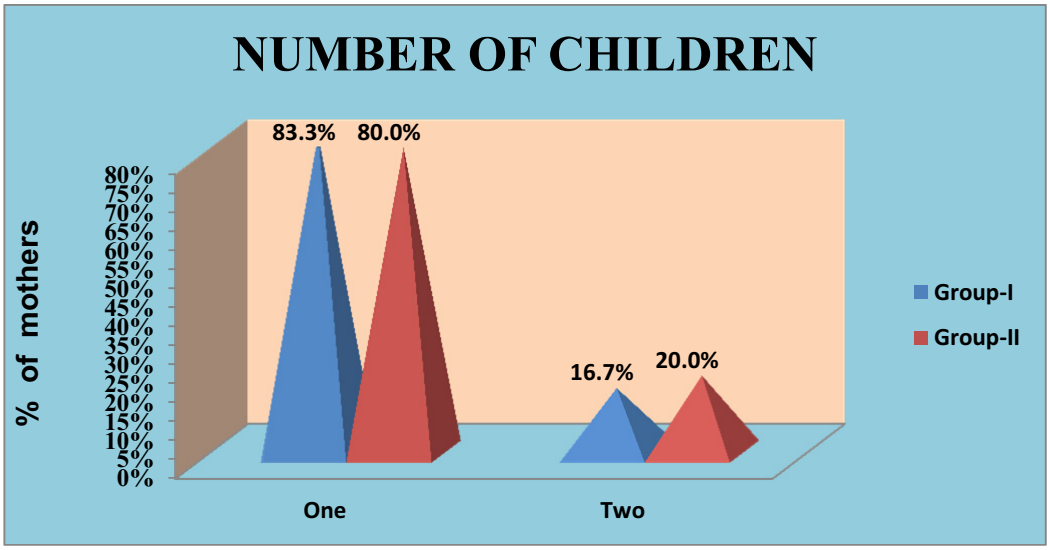


Figure-11, Multiple pyramid diagram shows distribution of subjects according to their number of children

The above pyramid diagram quotes that in group-I, majority of them 25(83.3%) had one child 5(16.7%) had two children. When compared to group-II, majority 24(80%) had one child and 6(20%) had two children.

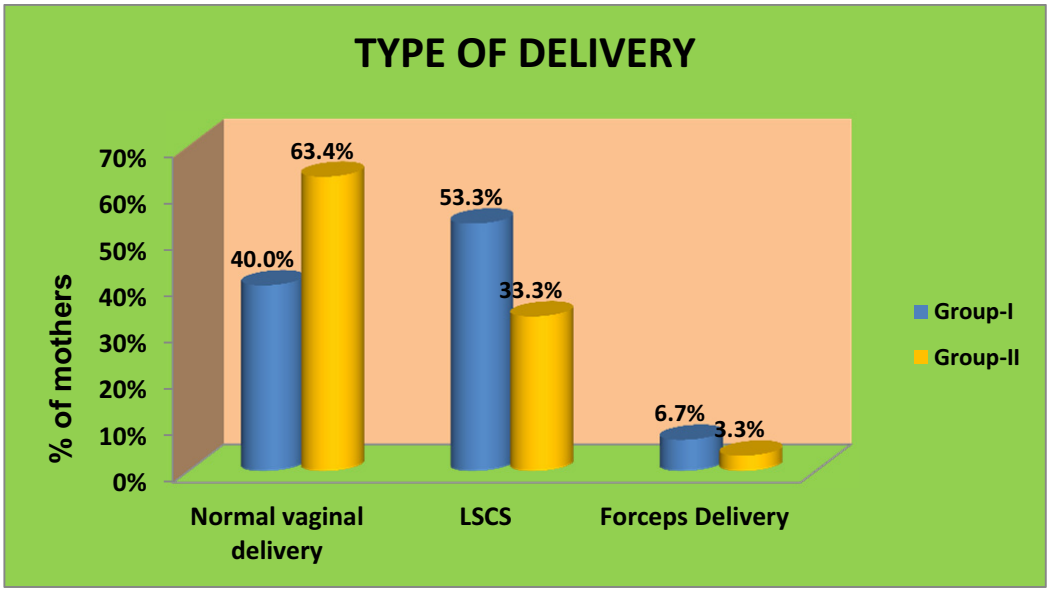


Figure-12, Cylinder diagram showing distribution of subjects according to their the type of delivery

The above cylinder diagram reveals that in group-I, majority 16(53.3%) were in LSCS,12(40%) were in normal delivery and 2(6.7%) were forceps delivery. In group-II, majority 19(63.4%) were in normal vaginal delivery and 10(33.3%) were in forceps delivery.

SECTION III

Description of breast engorgement with the use of 6 point lactation consultant scale and Storr scale.

Table 3

pretest level of breast engorgement pain with the use of Storr scale

Breast engorgement pain	Group			
	Group- I		Group- II	
	f	%	f	%
Normal	0	0.0%	0	0.0%
Mild	8	26.7%	12	40.0%
Moderate	17	56.7%	14	46.7%
Severe	5	16.7%	4	13.3%
Worst	0	0.0%	0	0.0%
Total	30	100.0%	30	100.0%

Table 3 assess the pretest level of breast engorgement pain to groups- I and group- II among post natal mothers admitted in post natal ward.

Among group-I, 8(26.7%) of them are having mild level, 17(56.7%) of them are having moderate level and 5(16.6%) of them are having severe level. Among group-II, 12(40.0%) of them are having mild level, 14(46.7%) of them are having moderate level and 4(13.3%) of them are having severe level.

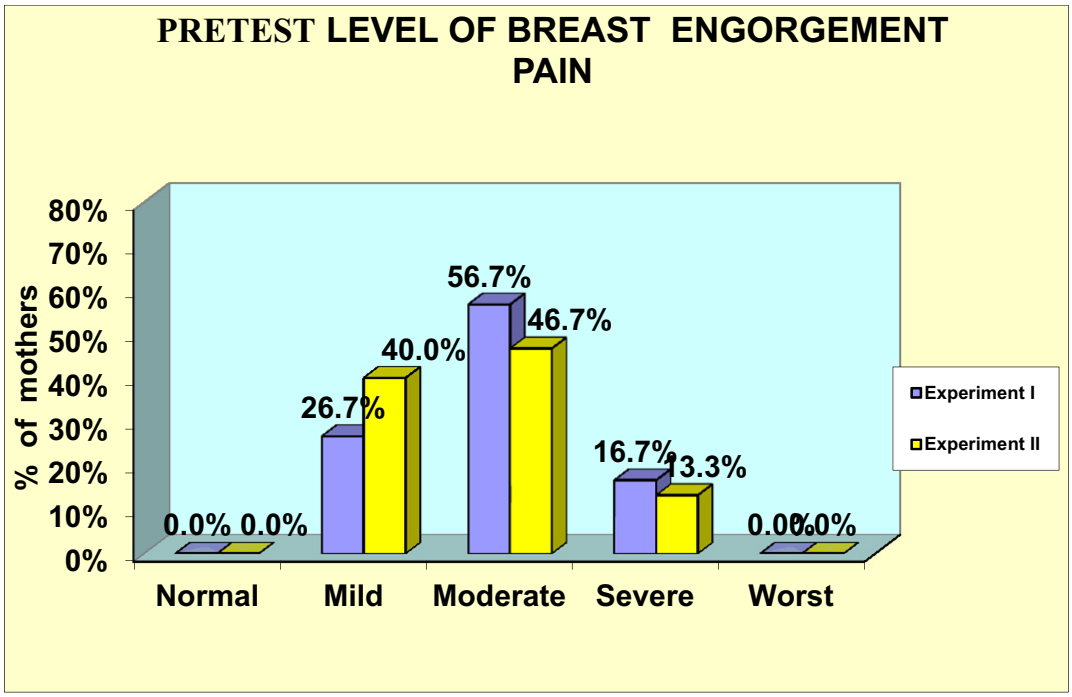


Figure-17, Multiple Bar diagram shows distribution of subjects according to their pretest level of breast engorgement

The above pyramid diagram illustrates that in group-I, 26.7% of them are having **mild level**, 56.7% of them are having **moderate level** and 16.6% of them are having **severe level**. Among group-II, 40.0% of them are having **mild level**, 46.7% of them are having **moderate level** and 13.3% of them are having **severe level**.

Table 4: Pretest level of signs and symptoms of breast engorgement with the use of 6 point lactation consultation scale

Signs and Symptoms of breast engorgement	Group			
	Group I		Group II	
	f	%	f	%
Soft, No change in breasts	**0**	**0.0%**	**0**	**0.0%**
Slight change in breasts	13	43.3%	10	33.3%
Firm, Non-tender breasts	14	46.7%	17	56.7%
Firm, beginning tenderness in breast	3	10.0%	3	10.0%
Firm, Tender	**0**	**0.0%**	**0**	**0.0%**
Very firm, Very tender	**0**	**0.0%**	**0**	**0.0%**
Total	**30**	**100.0%**	**30**	**100.0%**

Table 4 assess the pretest level of signs and symptoms of breast engorgement group I and group II among post natal mothers admitted in post natal ward.

Among group-I, 13(43.3%) of them are having Slight change in breasts, 14(46.7%) of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast level. Among group-II, 10(33.3%) of them are having Slight change in breasts, 17(56.7%)of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast level.

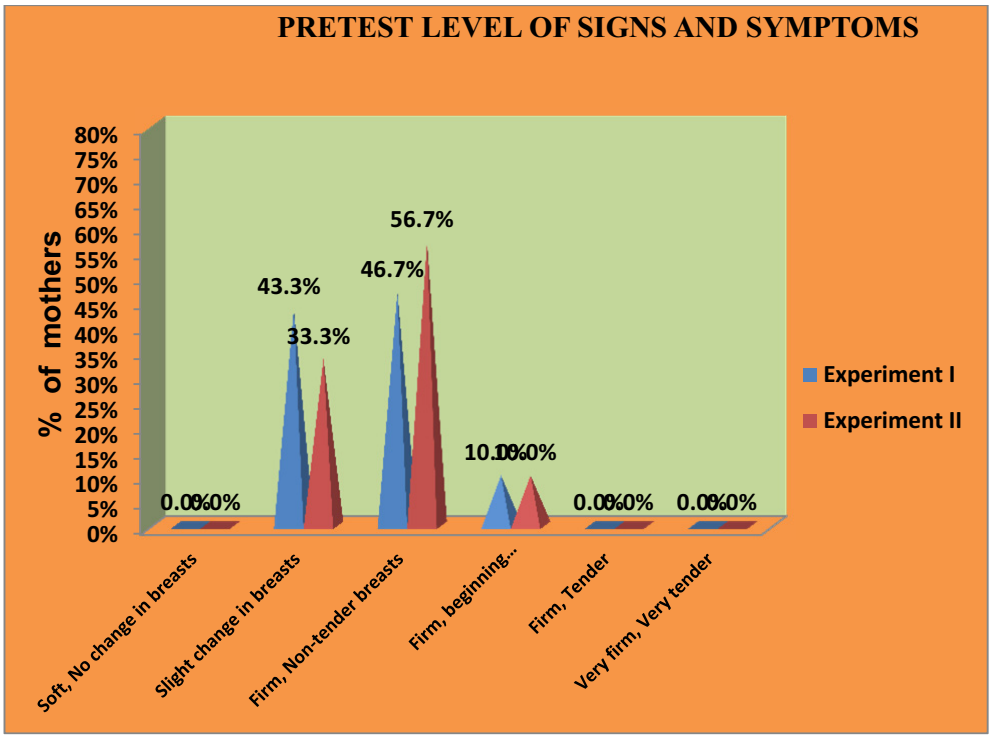


Figure-18, Multiple pyramid diagram showing distribution of subjects according to their pretest level of signs and symptoms of breast engorgement

The above pyramid diagram shows among I group-I, 43.3% of them are having Slight change in breasts, 46.7% of them are having Firm, Non-tender breasts level and 10.0% of them are having Firm, beginning tenderness in breast level. Among group-II, 33.3% of them are having Slight change in breasts, 56.7% of them are having Firm, Non-tender breasts level and 10.0% of them are having Firm, beginning tenderness in breast level.

SECTION IV

Effectiveness of closed system manual breast pump and hand expression on breast engorgement

Table 5

posttest level of breast engorgement pain with the use of Storr scale

BREAST ENGORGEMENT PAIN	Group				Calculated value	Table value	χ^2
	Group I		Group II				
	n	%	n	%			
Normal	15	50.0%	21	70.0%			**χ^2=6.05**
Mild	10	33.3%	9	30.0%			
Moderate	5	16.7%	**0**	**0.0%**	**6.05**	**5.99**	**p=0.01****
Severe	**0**	**0.0%**	**0**	**0.0%**			**DF=2**
Worst	**0**	**0.0%**	**0**	**0.0%**			**(p<0.01)**
Total	**30**	**100.0%**	**30**	**100.0%**			

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 5 assess the posttest level of breast engorgement to groups I andgroup-II among post natal mothers admitted in post natal ward.

Among group-I, **None of them are having severe or worst breast engorgement** score. 50.0% of them are having **normal level**, 33.3% of them are having mild level, 16.7% of them are having moderate level.

Among group-II, **None of them are having moderate, severe or worst breast engorgement** score. 70.0% of them are having **normal l**evel, 30.0% of them are having mild level.

Statistically there is a significant difference between group- I and group-II. Hand expression group are having more normal level than Manual Breast pump .

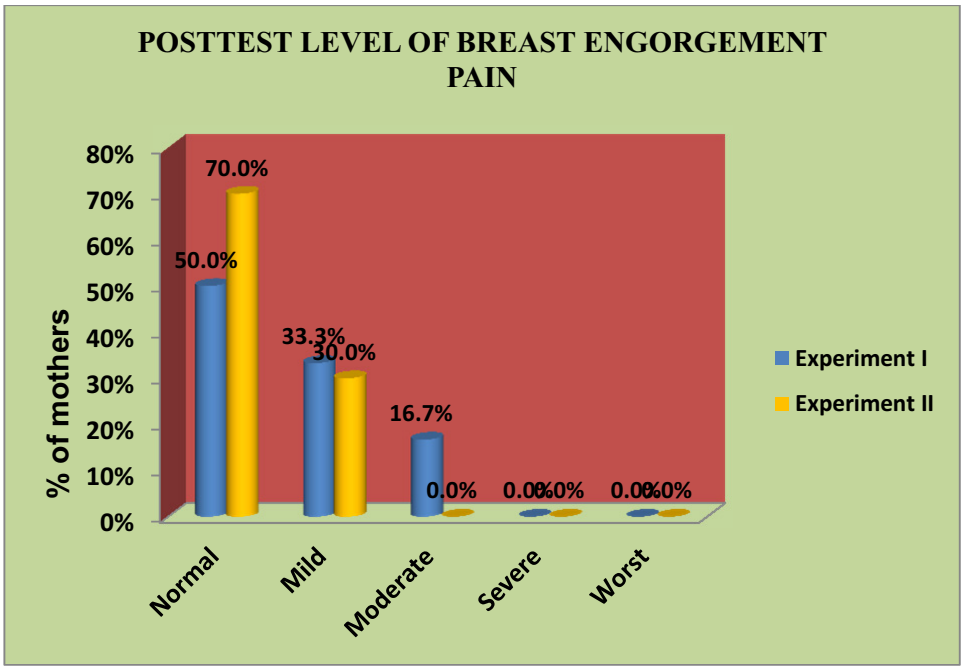


Figure- 19, Multiple Cylinder diagram showing distribution of subjects according to their posttest level of breast engorgement pain

In group-I, **50.0%** of them are having **normal level**, 33.3% of them are having mild level, 16.7% of them are having moderate level.

Among group-II, **70.0%** of them are having **normal level**, 30.0% of them are having mild level.

Statistically there is a significant difference between group- I and group- II. Hand expression group are having more normal level than Manual Breast pump . It was confirmed using chi square test.

Table 6

Posttest level of signs and symptoms of breast engorgement with the use of 6 point Lactation Consultation Scale

SIGNS AND SYMPTOMS OF BREAST ENGORGEMENT	Group				Calculated value	Table value	χ^2
	Group I		Group II				
	n	%	n	%			
Soft, No change in breasts	19	63.3%	26	86.7%	**4.35**	**5.84**	**χ^2=4.35 p=0.04 DF=1 (p<0.05)**
Slight change in breasts	11	36.7%	4	13.3%			
Firm, Non-tender breasts	**0**	**0.0%**	**0**	**0.0%**			
Firm, beginning tenderness in breast	**0**	**0.0%**	**0**	**0.0%**			
Firm, Tender	**0**	**0.0%**	**0**	**0.0%**			
Very firm, Very tender	**0**	**0.0%**	**0**	**0.0%**			
Total	**30**	**100.0%**	**30**	**100.0%**			

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 6 assess the posttest level of signs and symptoms of breast engorgement to groups- I and group- II among post natal mothers admitted in post natal ward.

Among group-I, 19(63.3%) of them are having **Soft, No change in breasts**,11(36.7%) of them are having **Slight change in breasts** .

Among group-II, 26(86.7%) of them are having **Soft, No change in breasts**,4(13.3%) of them are having **Slight change in breasts** .

Statistically there is a significant difference between closed system Manual Breast pump and Hand expression. Hand expression group are having more normal level than Manual Breast pump. It was confirmed using chi square test,

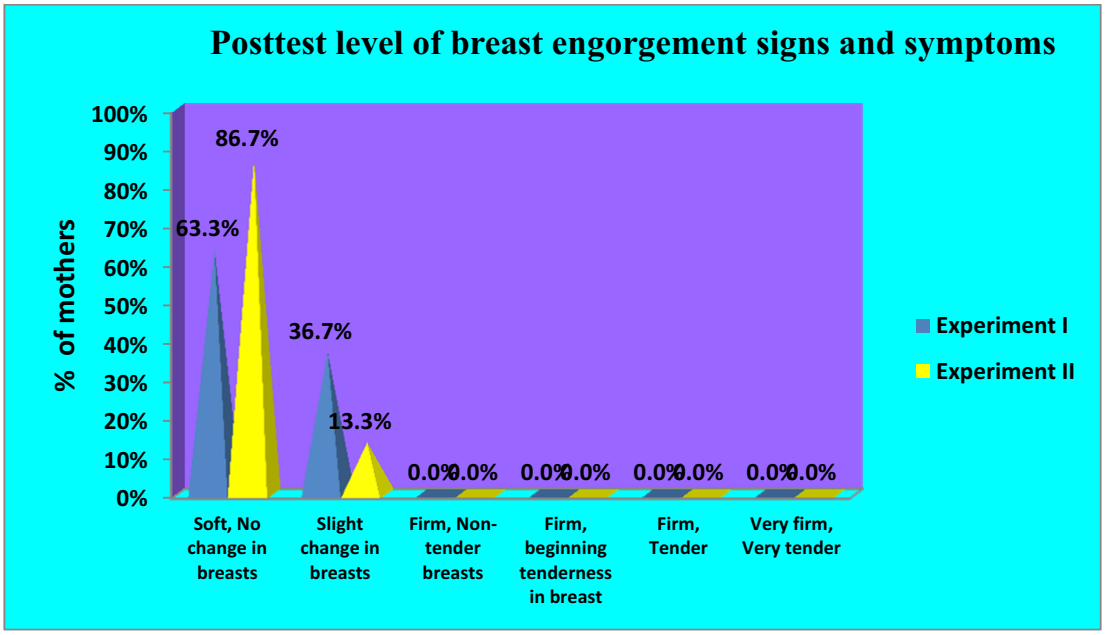


Figure- 20 Assess the posttest level of signs and symptoms of breast engorgement to groups I and group II.

Among group-I, 63.3% of them are having **Soft, No change in breasts**, 36.7% of them are having **Slight change in breast**.

Among group-II, 86.7% of them are having **Soft, No change in breasts**, 13.3% of them are having **Slight change in breast**.

Statistically there is a significant difference between closed system Manual Breast pump and Hand expression. Hand expression group are having more normal level than Manual Breast pump. It was confirmed using chi square test,

SECTION- V

Comparison of the breast engorgement score between group I and groupII

Table 7

Comparison of pretest and posttest mean, standard deviation and Mean difference of breast engorgement

GROUP		Pretest mean (SE)	Posttest mean(SE)	Mean difference	Mean percentage	t-value
Group-I	Breast engorgement score	2.66 (1.87)	1.36 (0.56)	1.3	32%	**t=7.49 p=0.01****
	Pain score	1.90 (1.90)	o.67 (0.66)	1.23	28.3%	**t=6.29 p=0.01****
Group-II	Breast engorgement score	2.66 (1.98)	1.06 (0.4)	1.6	40%	**t=10.78 p=0.001*****
	Pain score	1.83 (0.69)	0.30 (0.46)	1.53	38.3%	**t=9.29 p=0.001*****

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 7 shows the pretest and posttest mean, standard deviation and Mean difference of breast engorgement. When comparing the Breast engorgement score and pain score mean difference, in group-I is 1.3(32%)and 1.23(28.3%)whereas in group II it is 1.6(40%) and 1.53(38.3%). this difference is statistically significant. it was confirmed using students paired t-test.

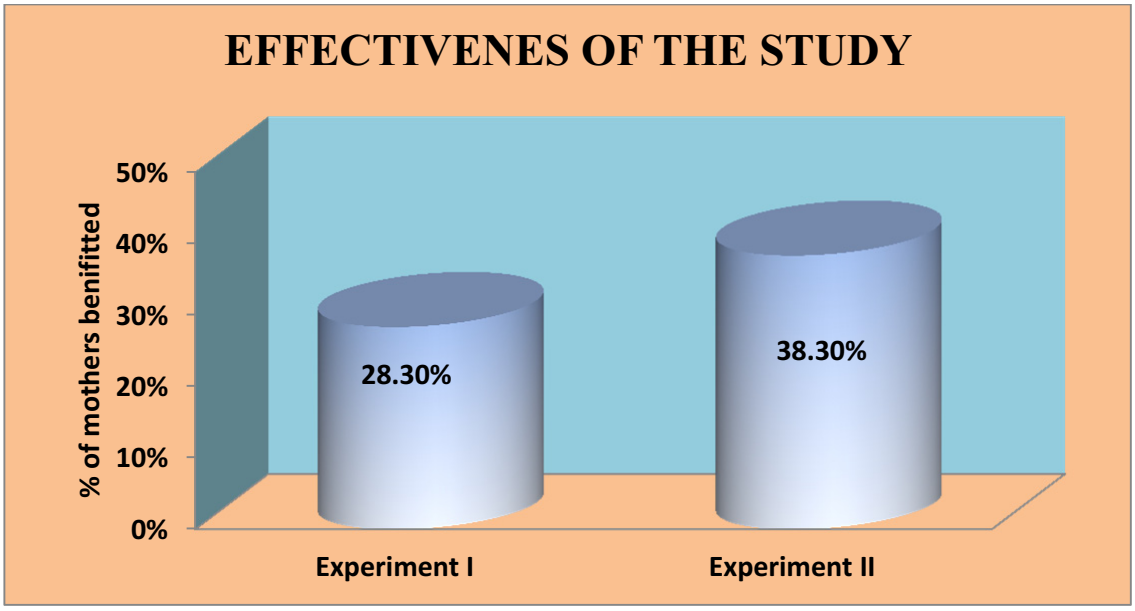


Figure-21 showsEffectiveness of closed system manual breast pump versus Hand expression on breast engorgement

Among group-I (**closed system manual breast pump)** ,Pretest and posttest difference score is 28.3%.

Among group-II (**Hand expression)**, Pretest and posttest difference score is 38.3%. Statistically there is a significant difference between group- I(closed system Manual Breast pump) and group- II(Hand expression). Hand expression group are having more normal level than Manual Breast pump. It was confirmed using chi square test,

SECTION VI

Association between post test level of breast engorgement score with their selected socio - demographic and obstetrical variables.

Table- 8

Association between posttest level of breast engorgement score and demographic variables(group- I)

n=60

variables		Posttest Level of breast engorgement						Total	χ2
		Normal		Mild		Moderate			
		f	%	f	%	f	%		
Age in years	15 -20 years	1	33.3%	2	66.7%	0	0.0%	3	**χ2=16.06 p=0.01** DF=6**
	21 -25 years	8	57.1%	6	42.9%	0	0.0%	14	
	26 -30 years	6	54.5%	2	18.2%	3	27.3%	11	
	> 30 years	0	0.0%	0	0.0%	2	100.0%	2	
Education	Primary	10	47.6%	6	28.6%	5	23.8%	21	χ2=4.06 p=0.40 DF=4
	Degree	3	75.0%	1	25.0%			4	
	Higher secondary	2	40.0%	3	60.0%			5	
Occupation	Home maker	6	46.2%	6	46.2%	1	7.7%	13	χ2=7.23 p=0.12 DF=4
	Private worker	4	36.4%	3	27.3%	4	36.4%	11	
	Cooly worker	5	83.3%	1	16.7%			6	
Income	Rs.5001 to 10,000	13	50.0%	9	34.6%	4	15.4%	26	χ2=0.28 p=0.76 DF=2
	Rs.10001 to 15,000	2	50.0%	1	25.0%	1	25.0%	4	
Religion	Hindu	13	48.1%	9	33.3%	5	18.5%	27	χ2=1.57 p=0.81 DF=3
	Muslim	1	100.0%					1	
	Christian	1	50.0%	1	50.0%			2	
Type of family	Nuclear family	7	41.2%	7	41.2%	3	17.6%	17	χ2=4.25 p=0.37 DF=3
	Joint family	8	66.7%	2	16.7%	2	16.7%	12	
	Extended family			1	100.0%			1	

Social support	Husband	11	52.4%	5	23.8%	5	23.8%	21	$\chi 2$=4.40 p=0.35 DF=3
	Friends and Neighbours	3	50.0%	3	50.0%			6	
	Relative	1	33.3%	2	66.7%			3	
Living area	Urban	2	18.2%	5	45.5%	4	36.3%	11	**$\chi 2$=8.32 p=0.02* DF=2**
	Rural	13	68.4%	5	26.3%	1	5.3%	19	
Dietary habits	Non vegetarian	15	50.0%	10	33.3%	5	16.7%	30	$\chi 2$=0.00 p=1.00 DF=1
Related information	No previous information	11	45.8%	9	37.5%	4	16.7%	24	$\chi 2$=2.45 p=0.87 DF=3
	Health personal	1	100.0%					1	
	Friends	1	100.0%					1	
	Family members	2	50.0%	1	25.0%	1	25.0%	4	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 8 shows the association between posttest Level of breast engorgement score and mothers socio-demographic variables of group-I.

Mothers in the age group of 15-20years 66.7% had normal breast and 33.3% had mild breast engorgement, in 21-25 years 57.1% had normal level and 42.9% had mild engorgement,26-30years 54.5% had normal level,18.2% had mild engorgement and 27.3% had moderate engorgement, above 30 years all of them had normal level.

With regard to residential area mothers living in urban area 18.2% had normal level,45.5% had mild engorgement and 36.3% had moderate engorgement. whereas mother living in rural area 68.4% had normal level,26.3% had mild engorgement and 5.3% had moderate engorgement. This shows younger and rural mothers are having more normal than others.

Table -9

Association between posttest level of breast engorgement score and obstetrical variables (group-- I)

Obstetrical variables		Posttest Level of breast						Total	χ2
		Normal		Mild		Moderate			
		f	%	f	%	f	%		
Mother's BMI	18.6 - 25.0	5	41.7 %	6	50.0 %	1	8.3%	12	χ2=2.77 p=0.24 DF=2
	25.1 - 30.0	10	55.6 %	4	22.2 %	4	22.2%	18	
No of children	One	13	52.0 %	9	36.0 %	3	12.0%	25	χ2=2.40 p=0.30 DF=2
	Two	2	40.0 %	1	20.0 %	2	40.0%	5	
Type of delivery	Normal vaginal delivery	8	66.7 %	3	25.0 %	1	12.5%	12	**χ2=12.22 p=0.01** DF=4**
	LSCS	7	43.8 %	7	43.8 %	2	12.4%	16	
	Forceps Delivery	0	0.0%	0	0.0%	2	100.0 %	2	
Sex of baby	Male	7	46.7 %	5	33.3 %	3	20.0%	15	χ2=0.26 p=0.87 DF=2
	Female	8	53.3 %	5	33.3 %	2	13.3%	15	
Obstetrical outcome	Preterm Baby	1	33.3 %	2	66.7 %			3	χ2=5.50 p=0.70 DF=8
	IUGR Baby	2	40.0 %	1	20.0 %	2	40.0%	5	
	Congenital anomaly	1	50.0 %	1	50.0 %			2	
	Healthy baby	3	60.0 %	2	40.0 %			5	
	Others	8	53.3 %	4	26.7 %	3	20.0%	15	
Feeding pattern	Expressed breast Milk	7	35.0 %	9	45.0 %	4	20.0%	20	χ2=5.50 p=0.07 DF=2
	Tube feeding	8	80.0 %	1	10.0 %	1	10.0%	10	
No. of post partum days	5-10 days	0	0.0%	3	50.0 %	3	50.0%	6	**χ2=13.30 p=0.05* DF=6**
	11 -15 days	5	62.5 %	3	37.5 %	0	0.0%	8	
	16 - 20 days	7	77.8 %	1	11.1 %	1	11.1%	9	
	> 20 days	3	42.8 %	3	42.8 %	1	14.4%	7	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 9 shows the association between posttest Level of breast engorgement score and mothers Obstetrical variables of group-I.

With regard to type of delivery among normal delivery 66.7% had normal level,25% had mild engorgement and 12.5% had moderate engorgement. In LSCS both normal and mild level 43.8% and 12.4% had moderate level breast engorgement. In Forceps delivery all of them had moderate engorgement.

While considering the number of post partum days in 5-10 days both mild and moderate engorgement percentage is 50%,among 11-15 days 62.5% had normal level,37.5% had mild breast engorgement. In 16-20 days 77.8% had normal level and both mild and moderate engorgement is 11.1%,mothers staying in hospital more than 20 days,42.8% normal and mild level and 14.4% had moderate breast engorgement. This shows that normal delivery and more stay mothers having more normal than others.

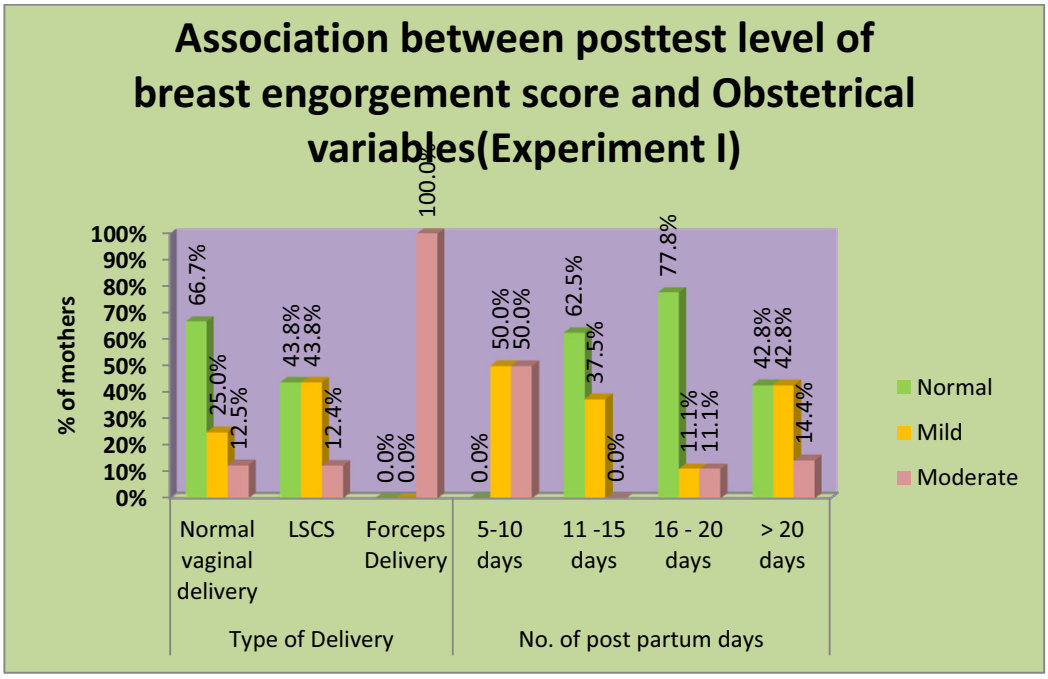


Figure-23,Multible bar diagram shows the association between posttest Level of breast engorgement score and mothers obstetrical variables of group-I.

The above bar diagram shows that normal delivery and more stay mothers having more normal than others. With regard to type of delivery among normal delivery 66.7% had normal level,25% had mild engorgement and 12.5% had moderate engorgement. In LSCS both normal and mild level 43.8% and 12.4% had moderate level breast engorgement. In Forceps delivery all of them had moderate engorgement.

While considering the number of post partum days in 5-10 days both mild and moderate engorgement percentage is 50%, among 11-15 days 62.5% had normal level,37.5% had mild breast engorgement. In 16-20 days 77.8% had normal level and both mild and moderate engorgement is 11.1%,mothers staying in hospital more than 20 days,42.8% normal and mild level and 14.4% had moderate breast engorgement.

Table 10

Association between posttest level of breast engorgement score and demographic variables(Group- II)

Demographic variables		Posttest Level of breast engorgement				Total	$\chi 2$
		Normal		Mild			
		n	%	n	%		
Age in years	15 -20 years	5	100.0%	0	0.0%	5	**$\chi 2$=8.31**
	21 -25 years	9	81.8%	2	18.2%	11	**p=0.03***
	26 -30 years	7	58.3%	5	41.7%	12	**DF=3**
	> 30 years	0	0.0%	2	100.0%	2	**significant**
Education	Primary	15	65.2%	8	34.8%	23	$\chi 2$=1.98 p=0.37
	Degree	4	100.0%	0	0.0%	4	DF=2
	Higher secondary	2	66.7%	1	33.3%	3	not significant
Occupation	Home maker	13	81.3%	3	18.8%	16	$\chi 2$=2.52 p=0.28
	Private worker	4	50.0%	4	50.0%	8	DF=2
	Cooly worker	4	66.7%	2	33.3%	6	not significant
Income	Rs.5001 to 10,000	17	68.0%	8	32.0%	25	$\chi 2$=0.28 p=0.59
	Rs.10001 to 15,000	4	80.0%	1	20.0%	5	DF=1 not significant
Religion	Hindu	17	65.4%	9	34.6%	26	$\chi 2$=1.97 p=0.37
	Muslim	3	100.0%			3	DF=2
	Christian	1	100.0%			1	Not significant
Type of family	Nuclear family	10	58.8%	7	41.2%	17	$\chi 2$=2.45 p=0.29
	Joint family	10	83.3%	2	16.7%	12	DF=2
	Extended family	1	100.0%			1	not significant
Social support	Husband	13	65.0%	7	35.0%	20	$\chi 2$=2.61 p=0.27
	Friends and Neighbours	5	100.0%			5	DF=2
	Relative	3	60.0%	2	40.0%	5	not significant
Living area	Urban	9	52.9%	8	47.1%	17	**$\chi 2$=5.43**
	Rural	12	92.3%	1	7.7%	13	**p=0.02*** **DF=1** **Significant**
Dietary habits	Non vegetarian	21	70.0%	9	30.0%	30	$\chi 2$=0.00 p=1.00 DF=1 not significant
Related information	No previous information	13	65.0%	7	35.0%	20	$\chi 2$=1.19 p=0.76
	Health personal	2	100.0%			2	DF=3
	Friends	3	75.0%	1	25.0%	4	not significant
	Family members	3	75.0%	1	25.0%	4	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 10 shows the association between posttest Level of breast engorgement score and mothers demographic variables of group-II.

Younger and rural mothers are having more normal than others. Statistical significance was calculated using chi square test. but there is no association between other socio demographic variables like education, occupation, income, religion, type of family, social support, dietary habits and related information.

Table 11

association between posttest level of breast engorgement score and obstetrical variables in (group- II)

n=60

OBSTETRICAL VARIABLES		Posttest Level of breast engorgement				Total	χ2
		Normal		Mild			
		f	%	f	%		
Mother's BMI	18.6 - 25.0	11	64.7%	6	35.3%	17	χ2=0.52 p=0.46
	25.1 - 30.0	10	76.9%	3	23.1%	13	DF=1 not significant
No of children	One	15	62.5%	9	37.5%	24	χ2=3.21 p=0.07
	Two	6	100.0%			6	DF=1 not significant
type of delivery	Normal vaginal delivery	16	84.2%	6	15.8%	19	
	LSCS	5	50.0%	5	50.0%	10	**χ2=6.06 p=0.04***
	Forceps Delivery	0	0.0%	1	100.0%	1	**DF=2 significant**
Sex of baby	Male	12	80.0%	3	20.0%	15	χ2=1.42 p=0.23
	Female	9	60.0%	6	40.0%	15	DF=1 not significant
Obstetrical outcome	Preterm Baby	2	66.7%	1	33.3%	3	
	IUGR Baby	4	50.0%	4	50.0%	8	
	Congenital anomaly	2	100.0%			2	χ2=3.33 p=0.50
	Healthy baby	2	100.0%			2	DF=4 not significant
	Others	11	73.3%	4	26.7%	15	
Feeding pattern	Expressed breast Milk	13	65.0%	7	35.0%	20	χ2=0.71 p=0.39
	Tube feeding	8	80.0%	2	20.0%	10	DF=1 not significant
No. of post partum days	5-10 days	6	75.0%	2	25.0%	8	
	11 -15 days	1	50.0%	1	50.0%	2	**χ2=7.78p=0.05**
	16 - 20 days	7	58.3%	5	41.7%	12	**DF=3 significant**
	> 20 days	7	87.5%	1	12.5%	8	

Table 11 shows the association between posttest Level of breast engorgement score and mothers demographic variables of group-II. Normal delivery and more stay mothers having more normal than others. Statistical significance was calculated using chi square test. But there is no association between other obstetrical variables like mothers BMI, number of children, sex of the baby, obstetrical outcome and feeding pattern to new born.

DISCUSSION

CHAPTER –V

DISCUSSION

This chapter discusses in details about the findings of analysis in relation to the objectives of the study. The problem stated was to find out the effectiveness of closed system Manual Breast pump and Hand expression on breast engorgement among postnatal mothers admitted in postnatal ward at Government Rajaji Hospital, Madurai. Breast engorgement is a condition that affects nearly all new mothers within the first few weeks of giving birth. The most often state reason for cessation of breast feeding in the first weeks postpartum is pain. Breast engorgement occurs in 72% to 85% of women among every 10 mothers, 6 mothers suffer with breast engorgement.

Breast engorgement occurs in the mammary glands due to expansion and pressure exerted by the synthesis and storage of breast milk. Commonly it occurs within 3 to 6 days after delivery. Breast engorgement can occur any time during lactation when milk is not transferred from the breast. women with inverted and flat nipple or if the baby does not latch properly, is hospitalized after birth, or cannot nurse for physical reasons e.g. cleft palate, cleft lip etc cannot fed the infant and they develop breast engorgement. finally they forced to stop the breast feeding. By applying either Hand expression or Manual Breast pump, breast engorgement will be relieved and there is a chance to improve the nipple condition and also improve the lactation also. There is no need to stop the breast feeding due to engorgement or other reason unless it is contraindicated.

The following were the objectives of the study and further discussion how these objectives were satisfied by the study.

Baseline variables of postnatal mothers with breast engorgement

When comparing age group in the group-1,majority of women 14 (46.7%) belongs to the age group between 21-25 years, 11 (36.6%) belonged to the age group of 26-30 years,3(10%)belong to 15-20 years of age group and 2 (6.7%) is above 30 years. whereas in the group-II women in the age group of 26-30 years 12 (40%), the age group between 21 – 25 years 11 (36.6%) and the age group of 15 – 20 years is 5 (16.7).and 2(6.7%) were above 30 years.

Regarding educational status, in the group-1, 21 (70%) had studied up to primary level education, 5 (16.7%) had studied up to higher secondary level, and the remaining 4 (13.3%) were graduate and above. On the other Hand in the group-II, 23 (76.7%) had studied up to primary level, 4 (13.3%) had studied up to Degree level, 3 (10%) had higher secondary education.

Regarding occupation, in the group-I, 13 (43.3%) were home maker, 11 (36.7%) were private employees, 6 (20%) were coolie workers. 2. But in the group-II, majority of them 16 (53.3%) were home maker, 8 (26.7%) were private employees, 6 (20%) were coolie workers.

Based on their family income majority in the group-I, 26 (86.7%) earned an income between Rs.5001- Rs.10,000,and 4 (13.3%) earned an income between Rs.10,001- Rs.15,000. Whereas in the group-II, majority of them 25 (83.3%) earned an income between Rs.5001- Rs.10,000,and 5 (16.7%) earned an income between Rs.10,001- Rs.15,000.

Related to religion in the group-I, majority 27 (90.0%) were Hindus, 2 (6.7%) were Christians, and 1 (3.3%) Muslim. Whereas in the group-II, Hindus were 26 (86.7%), and the remaining 3(10%) were Muslims, and 1 (3.3%) Christian.

Regarding type of family, in the group-1 majority of them 17 (56.7%) from nuclear family, 12 (40%) from joint family, 1 (3.3%) from extended family.And in the group-II, majority of them 17 (56.7%) from nuclear families, 12 (40.0%) from joint family, 1 (3.3%) from extended family.

About their social support in group-1, 21(70%) women get support from their husband,6(20%)from friends and neighbors, and 3(10%) get support from their relative. And in group-II, majority 20(66.6%) women get support from their husband,5(16%) were from friends and neighbors and 5(16%) from their relative.

Regarding living area 19(63.3%) from rural and 11(36.7%) from urban in group-I. Where as in Group-II, majority 17(56.7%) from urban and 13(43.3%) from rural areas.

When identifying the dietary habits all subject in the group-I and II were non vegetarian.

According to previous sources of information regarding breast milk expression in group-I majority 24(80.0%) of the women did not receive any information, 4 (13.3%) of the women received information from their family members. 1 (3.3%) received information from health personnel and friends. Whereas in the group-II, 20(66.7%) of the women did not receive any information.4 (13.3%) of them received information from friends and family members and 2(6.7%) of them received information from their family members.

When comparing the mothers BMI in group-1,BMI-25.1-30 their frequency is 18 (60%)and the BMI-18.6-25 the frequency is 12(40%).In group-II, majority 17(56.7%) were in BMI-18.6-25.and 13(43.3%)were in 25.1-30 BMI.

While considering the number of children among group-I, majority of them 25(83.3%) had one child,5(16.7%) had two children. When compared to group-II, majority 24(80%) had one child and 6(20%) had two children.

When identifying the type of delivery in group-I, majority 16(53.3%) were in LSCS,12(40%) were in normal delivery and 2(6.7%) were forceps delivery. In group-II, majority 19(63.4%) were in normal vaginal delivery and 10(33.3%) were in forceps delivery.

Regarding sex of the baby, in group-I, both male and female baby frequency 15(50%), whereas in the group-II both male and female babies frequency was 15(50%).

While considering the obstetrical outcome in group-I ,majority of mother's babies 15(50%) were suffered from other illness, IUGR 5(16.6%), healthy babies 5(16.7%) and preterm birth 3(10%), babies with congenital anomaly were 2(6.7%). In group-II, babies suffered from other illness were 15 (50%), preterm birth 3(10%),IUGR 5(16.6%),congenital anomaly 2(6.7%),and healthy babies were 2(6.7%).

When comparing the milk expression data in group-I, and group-II, infant feeding through expressed breast milk were 20(66.7%) and tube feeding were 10(33.3%).

Regarding the number of post partum days in group-I, mothers 9(30%) were in 16-20thpost operative, more than 20 days 7(23.3%),mothers 8(26.7%) were in 11-15th days, and 5-10th days were 6(20%).In group-II, majority 12(40%) were in 16-20thpost operative days, more than 20th and 5-10 post operative days mothers were 8(26.7%) and mothers 2(6.6%) were in 11-15thpost partum days.

Findings based on the objectives

The first objective of the study was to assess the level of breast engorgement to group I and group- II among post natal mothers.

The analysis on pretest level of breast engorgement pain revealed that out of 30 subject in group-I, 8(26.7%) of them are having mild level, 17(56.7%) of them are having moderate level and 5(16.6%) of them are having severe level. Among 30 subject in group-II, 12(40.0%) of them are having mild level, 14(46.7%) of them are having moderate level and 4(13.3%) of them are having severe level.

While assessing the pretest level of signs and symptoms of breast engorgement in group-I, 13(43.3%) of them are having Slight change in breasts,14(46.7%) of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast level. In group-II, 10(33.3%) of them are having Slight change in breasts, 17(56.7%)of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast.

It was also consistent with the study conducted during 2006 by Middleton, & Simmons. Timing of Engorgement of the studies reviewed, engorgement was not identified in the first 24 hours postpartum. By 48 hours postpartum 4.9% of mothers experienced engorgement and by 78 hours postpartum 65% of mothers had noticed breast changes. Overall, 95% of women experienced firm breasts with some tenderness, though only 47% of women experienced very firm, very tender breasts. The length of engorgement for the majority of women ranged from 3 to 8 days postpartum, and the longest engorgement recorded was 14 days. Mothers who gave birth by caesarean section appear to experience engorgement 24 to 48 hours later than mothers who gave birth vaginally

The second objective was to evaluate the effectiveness of closed system Manual Breast pump versus Hand expression on breast engorgement among post natal mothers.

The analysis revealed that the posttest level of breast engorgement pain, among 30 subject in group-I, 15(50.0%) of them are having normal level, 10(33.3%) of them are having mild level, 5(16.7%) of them are having moderate level. Among 30 subject in group-II, 21(70.0%) of them are having normal level, 9(30.0%) of them are having mild level.

When assessing the posttest level of signs and symptoms of breast engorgement to groups I and group-II among post natal mothers admitted in post natal ward. Among group-I,19(63.3%) of them are having Soft, No change in breasts,11(36.7%) of them are having Slight change in breasts.Among group-II,26(86.7%) of them are having Soft, No change in breasts,4(13.3%) of them are having Slight change in breasts .

Statistically there is a significant difference between group I(closed system Manual Breast pump) and group II(Hand expression). Hand expression group are having more normal level than Manual Breast pump. It was confirmed using chi square test.

The above data was supported by the study conducted by Mary Fewtrell et al., (2001) the objective of this study was to compare the efficacy of Manual Breast pump and mini electric pump.60 term breast feeding mothers were used the manual pump and electric pump in randomized order 8 weeks postpartum, expressing for 10 minutes from each breast. Mothers were rated the pump characteristics by questionnaire There was no significant difference in the milk volume and fat content. The Manual Breast pump was rated significantly better than electric breast pump.

Thus the research hypothesis- **H_1 : There is a significant difference in the pre-test and post-test level of breast engorgement among post-natal mothers receiving closed system Manual Breast pump application and Hand expression** was retained.

The third objective was to compare the breast engorgement score between group I and group II among post natal mothers.

Among group I, Pretest and posttest difference score 1.23 (28.3%) this difference is statistically significant. it was confirmed using students paired t-test. Among group II, Pretest and posttest difference score 1.53 (38.3%) this difference is statistically significant. it was confirmed using students paired t-test.

It was also consistent with the study conducted during 2006 by **Yvonne CNM,** on the management of postpartum breast engorgement in breast feeding women by mechanical extraction of milk. Minimal engorgement was experienced by 46% of the subjects. A control group (n=33) who experienced breast engorgement & followed standard management practice was compared to an experimental group (n=34) who used a Hand operated pump to relieve engorgement symptoms. They suggested that mechanical removal of milk is an effective way to increase the comfort & decrease the symptoms of engorgement.

Thus the research hypothesis- **H2: There is a significant difference in the post-test level of breast engorgement between closed system Manual Breast pump and Hand expression of breast milk .**

The fourth objective was to associate the level of breast engorgement score among two groups of post natal mothers with selected demographical variables.

The analysis revealed that With regard to age of the mother the calculated **χ2** value was **8.31, p=0.03*** which showed that there is a significant association between posttest score of breast engorgement. And in the living area of mother it was also found that the calculated **χ2** value was **5.43, p=0.02*** which showed there was also a significant association between breast engorgement score. It further revealed that there was no significant association of posttest score knowledge with other selected baseline variables.

With regard to type of delivery the calculated χ2 value was **6.06, p=0.04*** which showed thatthere is significant association between post test score of breast engorgement and the type of delivery. And the number of post operative days the calculated **χ2**value was **=7.78, p=0.05**. which showed that there is a significant association between posttest score of breast engorgement and the number of post operative days. Statistical significance was calculated using chi square test.

Hence the hypothesis- H_3: stated earlier that **There is a significant association in the post test level of breast engorgement score with their selected baseline variables among post-natal mothers** was retained**.**

SUMMARY

CONCLUSION,

IMPLICATION &

RECOMMENDATIONS

CHAPTER - VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATION.

This chapter contains the summary of the study conducted and the conclusions which were extracted from the data analysis. It tells about the limitation and restrictions for the study and also the implications for the conducted study in different areas of nursing like nursing education, nursing administration, nursing practice and in nursing research.

6.1 Summary

Special care of the breasts during pregnancy is an important preparation for breastfeeding. During antenatal period, the breasts often have a feeling of fullness and become larger, heavier, and more pendulous because of the stretching of the cooper's ligament that supports the breast. so often noticeable after delivery owing to the increased weight of the breasts during pregnancy and lactation.

Helen Graham (2007) revealed that the changes commonly seen include tenderness / pain, lumpiness / lump and nipple changes. Unlike the many other normal changes that occur to the breasts, pregnancy offers many visible signs that the breasts are changing. Initial changes experienced by many women include tenderness of the breast and nipple and an increase in the size of the breasts.

Babies who do not receive human milk are more likely to suffer health problems both as newborns and later in life. Not all babies are able to feed at the breast because they are premature, ill or separated from their mothers and so expressed milk is needed. Mothers may also want to express milk for their own comfort or to increase supply. The most suitable method for milk expression may depend on the time since birth, purpose of expression and the individual mother and

infant. Hand expression and lower cost pumps may be as effective, or more effective, than large electric pumps for some outcomes. Quality of milk constituents may vary depending on method of expression or pumping.

Hence the investigator conducted a study to Evaluate the effectiveness of closed system Manual Breast pump versus Hand expression on breast engorgement among postnatal mothers admitted in post natal ward at Government Rajaji Hospital Madurai.

The objectives of the study were

- To assess the level of breast engorgement to group-I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To evaluate the effectiveness of closed system Manual Breast pump for group-1 and Hand expression for group-II on breast engorgement among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To compare the breast engorgement score between group-I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.
- To associate the level of breast engorgement score with their selected socio-demographical variables to groups- I and group-II among post natal mothers admitted in post natal ward at Government Rajaji Hospital.

The study assumptions were;

1. Postnatal mothers may have different level of breast engorgement.
2. Breast engorgement may lead to mastitis, breast abscess and leads to poor feeding to neonate.

The following hypotheses were tested;

H_1 : There is a significant difference between pre-test and post-test level of breast engorgement among group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.

H_2 : There is a significant difference in the post-test level of breast engorgement between group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai.

H_3 : There is a significant association in the level of breast engorgement among group-I and group-II post-natal mothers admitted in post natal ward at Government Rajaji Hospital, Madurai with their selected socio-demographic variables.

This study was conducted in postnatal ward and cesarean postoperative ward in Government Rajaji Hospital, Madurai. The research design for this study is true-experimental comparative research design.

The population for the study was all postnatal mothers those who have breast engorgement. The total subjects included in this study were 60, selected by simple random sampling technique. Thirty samples for group-I and 30 samples for group-II. Researcher uses the Closed system Manual breast pump to experimental group I and Hand expression to group-II. Intervention is three times a day at three hours interval. Duration of intervention per subject is twenty minutes, ten minutes for each breast. post test was done after the three intervention in same day. Data were analyzed by using both descriptive and inferential statistics.

6.2 Major findings of the study

When comparing age group in the group-1,majority of women 14 (46.7%) belongs to the age group between 21-25 years, 11 (36.6%) belonged to the age group of 26-30 years,3(10%)belong to 15-20 years of age group and 2 (6.7%) is above 30

years. whereas in the group-II women in the age group of 26-30 years 12 (40%), the age group between 21 – 25 years 11 (36.6%) and the age group of 15 – 20 years is 5 (16.7).and 2(6.7%) were above 30 years.

Regarding educational status, in group-1, 21 (70%) had studied up to primary level education, 5 (16.7%) had studied up to higher secondary level, and the remaining 4 (13.3%) were graduate and above. On the other Hand in the group-II, 23 (76.7%) had studied up to primary level, 4 (13.3%) had studied up to Degree level, 3 (10%) had higher secondary education.

Regarding occupation, in the group-I, 13 (43.3%) were home maker, 11 (36.7%) were private employees, 6 (20%) were coolie workers. 2. But in the group-II, majority of them 16 (53.3%) were home maker, 8 (26.7%) were private employees, 6 (20%) were coolie workers.

Based on their family income majority in the group-I, 26 (86.7%) earned an income between Rs.5001- Rs.10,000,and 4 (13.3%) earned an income between Rs.10,001- Rs.15,000. Whereas in the group-II, majority of them 25 (83.3%) earned an income between Rs.5001- Rs.10, 000,and 5 (16.7%) earned an income between Rs.10,001- Rs.15,000.

Related to religion in group-I, majority 27 (90.0%) were Hindus, 2 (6.7%) were Christians, and 1 (3.3%) Muslim. Whereas in the group-II, Hindus were 26 (86.7%), and the remaining 3(10%) were Muslims, and 1 (3.3%) Christian.

Regarding type of family, in the group-1 majority of them 17 (56.7%) from nuclear family, 12 (40%) from joint family, 1 (3.3%) from extended family. And in the group-II, majority of them 17 (56.7%) from nuclear families, 12 (40.0%) from joint family, 1 (3.3%) from extended family.

About their social support in group-1, 21(70%) women get support from their husband,6(20%)from friends and neighbors, and 3(10%) get support from their relative. And in group-II, majority 20(66.6%) women get support from their husband,5(16%) were from friends and neighbors and 5(16%) from their relative.

Regarding living area 19(63.3%) from rural and 11(36.7%) from urban in group-I. Where as in Group-II, majority 17(56.7%) from urban and 13(43.3%) from rural areas.

When identifying the dietary habits all subject in the group-I and II were non vegetarian.

According to previous sources of information regarding breast milk expression in the group-I majority 24(80.0%) of the women did not receive any information, 4 (13.3%) of the women received information from their family members. 1 (3.3%) received information from health personnel and friends. Whereas in the group-II, 20(66.7%) of the women did not receive any information.4 (13.3%) of them received information from friends and family members and 2(6.7%) of them received information from their family members.

When comparing the mothers BMI in group-1,BMI-25.1-30 their frequency is 18 (60%)and the BMI-18.6-25 the frequency is 12(40%).In group-II, majority 17(56.7%) were in BMI-18.6-25.and 13(43.3%)were in 25.1-30 BMI.

While considering the number of children among group-I, majority of them 25(83.3%) had one child,5(16.7%) had two children. When compared to group-II, majority 24(80%) had one child and 6(20%) had two children.

When identifying the type of delivery in group-I, majority 16(53.3%) were in LSCS,12(40%) were in normal delivery and 2(6.7%) were forceps delivery. In group-

II, majority 19(63.4%) were in normal vaginal delivery and 10(33.3%) were in forceps delivery.

Regarding sex of the baby, in group-I, both male and female baby frequency 15(50%), whereas in the group-II both male and female babies frequency was 15(50%).

While considering the obstetrical outcome in group-I, majority of mother's babies 15(50%) were suffered from other illness, IUGR 5(16.6%), healthy babies 5(16.7%) and preterm birth 3(10%), babies with congenital anomaly were 2(6.7%). In group-II, babies suffered from other illness were 15 (50%), preterm birth 3(10%),IUGR 5(16.6%),congenital anomaly 2(6.7%),and healthy babies were 2(6.7%).

When comparing the milk expression data in group-I, and group-II, infant feeding through expressed breast milk were 20(66.7%) and tube feeding were 10(33.3%).

Regarding the number of post partum days in group-I, mothers 9(30%) were in 16-20thpost partum days, more than 20 days 7(23.3%),mothers 8(26.7%) were in 11-15th days, and 5-10th days were 6(20%). In group-II, majority 12(40%) were in 16-20thpost partum days, more than 20th and 5-10 post partum days mothers were 8(26.7%) and mothers 2(6.6%) were in 11-15thpost partum days.

While assessing the pretest level of breast engorgement pain, Among group I, 8(26.7%) of them are having mild level, 17(56.7%) of them are having moderate level and 5(16.6%) of them are having severe level. Among group II, 12(40.0%) of them are having mild level, 14(46.7%) of them are having moderate level and 4(13.3%) of them are having severe level. When assessing the pretest level of signs and symptoms of breast engorgement, Among group-I, 13(43.3%) of them are having Slight change

in breasts, 14(46.7%) of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast level. Among group-II, 10(33.3%) of them are having Slight change in breasts, 17(56.7%)of them are having Firm, Non-tender breasts level and 3(10.0%) of them are having Firm, beginning tenderness in breast level.

In posttest score of breast engorgement pain, Among group-I, None of them are having severe or worst breast engorgement score. 50.0% of them are having normal level,10(33.3%) of them are having mild level,5(16.7%) of them are having moderate level. Among group-II, None of them are having moderate, severe or worst breast engorgement score.21(70.0%) of them are having normal level,9(30.0%) of them are having mild level.

Statistically there is a significant difference between group I(closed system Manual Breast pump) and group II(Hand expression). Hand expression group are having more normal level than Manual Breast pump.

When assessing the posttest level of signs and symptoms of breast engorgement, Among group-I, None of them are having Firm, Non-tender breasts Firm, beginning tenderness in breast, Firm, Tender and Very firm, Very tender breast engorgement score. 63.3% of them are having Soft, No change in breasts, 36.7% of them are having Slight change in breasts. Among group-II, None of them are having Firm, Non-tender breasts Firm, beginning tenderness in breast, Firm, Tender and Very firm, Very tender breast engorgement score. 86.7% of them are having Soft, No change in breasts, 13.3% of them are having Slight change in breasts

Statistically there is a significant difference between group I(closed system Manual Breast pump) and group II(Hand expression). Hand expression group are having more normal level than Manual Breast pump.

Among group I, Pretest and posttest difference score 1.23 (28.3%) this difference is statistically significant. Among group II, Pretest and posttest difference score 1.53 (38.3%) this difference is statistically significant.

The analysis revealed that with regard to age of the mother the calculated **χ2** value was **8.31, p=0.03***which showed that there is a significant association between posttest score of breast engorgement. And in the living area of mother it was also found that the calculated **χ2** value was **5.43, p=0.02***which showed there was also a significant association between breast engorgement score. It further revealed that there was no significant association of posttest score knowledge with other selected baseline variables.

With regard to type of delivery was associated with post test score. The calculated χ2 value was **6.06, p=0.04*** there is significant association between the number of post operative days **χ2=7.78, p=0.05** which showed that there is a significant association between posttest score of breast engorgement. Younger and rural mothers are having more normal than others. Normal delivery and more stay mothers having more normal than others.

6.3 Conclusion

Statistical evidence proved that Hand expression of breast milk is more effective than closed system Manual Breast pump in reducing the breast engorgement. Hand expression group are having more normal level than Manual Breast pump and many women find this the easiest way to express. Manual skill and practice is important in expressing the breast milk from the breast. Manual expression is advantageous over the mechanical pumping. It increases the level of prolactin which helps to maintain lactation for longer period. It can be practiced anywhere and costs nothing.

6.4 Implication of the study;

The investigator had drawn implications from this study for various areas such as in nursing practice, nursing education, nursing administration and nursing research.

Implications for nursing practice;

- Nurses have the responsibility to give Education on Hand expression and its benefits and promote a positive attitude towards breast feeding the baby.
- There is a need to emphasize communication skills and techniques in breastfeeding training in addition to teaching positioning and attachment.
- The extended roles of professional nurses can emphasize more about the initiation of breast feeding and exclusive feeding and Prevention of breast engorgement.

Implications for nursing education;

- The Nursing curriculum should consist of knowledge related to removal of breast milk from the breast and Hand expression technique. Nursing students should be made aware of their role in health promotion and prevention of breast complication in present and future, which may help in achieving the goal of health for all.
- Nursing students should be made aware of the importance of manual removal of milk from the breast and educating the public regarding technique of breast feeding and prevention of breast engorgement.

Implications for nursing administration;

- The nurse administrator should take interest in providing health information to the public/ community regarding the breast engorgement and its causes, complication of poor breast feeding.

- The nurse administrator must supervise the activities related to breast feeding programme.
- The nurse administrators can also encourage the nurses to use other cost effective intervention such as earlier initiation of breast feeding, technique and position of baby to the breast and duration of feeding to the baby.

Implications for nursing research;

- Nurses should take initiative to conduct research on the nature and severity of problems related to breast engorgement.
- The nurse researcher should motivate the clinical and community nurse to apply research findings and can bring out new cost effective and innovative procedures to improve the knowledge and attitude among nursing students
- This study can be a baseline for future studies and this study can be inspired by other investigators to carry out further studies.

6.5 Recommendations

On the basis of the present study the following recommendations have been made for the further studies;

- The study can be replicated with a large sample size with different baseline Characteristics.
- A comparative study can be done between electric breast pump and Hand expression of breast milk.
- A descriptive study may be conducted to find out the nature of problems related to Hand expression.

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APPENDIX

APPENDIX-I

ETHICAL COMMITTEE APPROVAL TO CONDUCT THE STUDY

Ref.No.10189/E1/5/2014

Madurai Medical College,
Maduai -20. Dated: 13-10.2014.

Institutional Review Board/Independent Ethics Committee
Capt.Dr.B.Santhakumar,MD (FM). deanmdu@gmail.com
Dean, Madurai Medical College &
Government Rajaji Hospital, Madurai 625 020 . Convenor

Sub: Establishment – Madurai Medical College, Madurai-20 –
Ethics Committee Meeting – Meeting Minutes - for October 2014 –
Approved list – reg.

The Ethics Committee meeting of the Madurai Medical College, Madurai was held on October 15th 2014 at 10.00 Am to 12.00 Noon at Anaesthesia Seminar Hall at Govt. Rajaji Hospital, Madurai . The following members of the Ethics Committee have attended the meeting.

1.Dr.V.Nagarajan,M.D.,D.M(Neuro) Ph: 0452-2629629 Cell No.9843052029 nag9999@gmail.com.	Professor of Neurology (Retired) D.No.72, Vakkil New Street, Simmakkal, Madurai -1	Chairman
2.Dr.Mohan Prasad, MS.M.Ch. Cell.No.9843050822 (Oncology) drbkcmp@gmail.com	Professor & H.O.D of Surgical Oncology (Retired) D.No.32, West Avani Moola Street, Madurai.-1	Member Secretary
3. Dr.L.Santhanalakshmi, MD (Physiology) Cell No.9842593412 dr.l.santhanalakshmi@gmail.com.	Vice Principal, Prof. & H.O.D. Institute of Physiology Madurai Medical College	Member
4.Dr.K.Parameswari, MD(Pharmacology) Cell No.9994026056 drparameswari@yahoo.com.	Director of Pharmacology Madurai Medical College.	Member
5.Dr.S.Vadivel Murugan, MD., (Gen.Medicine) Cell No.9566543048 svadivelmurugan_2007@rediffmail.com.	Professor & H.O.D of Medicine Madurai Medical College	Member
6.Dr.A.Sankaramahalingam, MS., (Gen. Surgery) Cell.No.9443367312 chandrahospitalmdu@gmail.com	Professor & H.O.D. Surgery Madurai Medical College.	Member
7.Mrs.Mercy Immaculate Rubalatha, M.A., Med., Cell.No.9367792650 lathadevadoss86@gmail.com	50/5, Corporation Officer's Quarters, Gandhi Museum Road, Thamukam, Madurai-20.	Member
8.Thiru.Pala.Ramasamy, B.A.,B.L., Cell.No.9842165127 palaramasamy2011@gmail.com	Advocate, D.No.72,Palam Station Road, Sellur, Madurai-20.	Member
9.Thiru.P.K.M.Chelliah, B.A., Cell No.9894349599 pkmandco@gmail.com	Businessman, 21 Jawahar Street, Gandhi Nagar, Madurai-20.	Member

The following Project was approved by the Ethical Committee

Name of P.G.	Course	Name of the Project	Remarks
S.Kanis Rexcilin Frida	M.Sc (Nursing) 1st year Obstetrics and Gynecologiy, Madurai Medical College, Madurai.	A study to evaluate the effectiveness of closed system manual breast pump and hand expression on breast engorgement among postnatal mothers admitted at postnatal ward at GRH, Madurai	Approved

Please note that the investigator should adhere the following: She/He should get a detailed informed consent from the patients/participants and maintain it Confidentially.

1. She/He should carry out the work without detrimental to regular activities as well as without extra expenditure to the institution or to Government.
2. She/He should inform the institution Ethical Committee, in case of any change of study procedure, site and investigation or guide.
3. She/He should not deviate the area of the work for which applied for Ethical clearance. She/He should inform the IEC immediately, in case of any adverse events or Serious adverse reactions.
4. She/He should abide to the rules and regulations of the institution.
5. She/He should complete the work within the specific period and if any Extension of time is required He/She should apply for permission again and do the work.
6. She/He should submit the summary of the work to the Ethical Committee on Completion of the work.
7. She/He should nct claim any funds from the institution while doing the work or on completion.
8. She/He should understand that the members of IEC have the right to monitor the work with prior intimation.

Member Secretary
Ethical Committee

Chairman
Ethical Committee

13.11.14
DEAN/Convenor
Madurai Medical College &
Govt. Rajaji Hospital, Madurai.

To
The above Applicant
-thro. Head of the Department concerned

APPENDIX-II

LETTER SEEKING PERMISSION FOR VALIDATION OF CONTENT AND TOOL

From

Mrs.Kanis Rexcilin Frida
M.sc(N)-II year
College of nursing,
Madurai medical college,
Madurai-20.

To

Mrs.S.Jeyasankari,M.Sc (N)
Associate Professor in OBG Nursing,
PIMS college of Nursing,
Pandicheri
Through the proper channel,

Respected madam,

Sub: requesting opinion and suggestion for content validity of tool to **"Evaluate the Effectiveness of closed system Manual Breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai".**

I am second year M.sc(Nursing) student of college of nursing, Madurai medical college, Madurai. In partial fulfillment of master degree in nursing, I have selected the above topic for the dissertation to submit to the Dr.MGR Medical University, Chennai. I request you to kindly validate the tool and give your expert opinion for secondary modification and also I would be very grateful if you could refine problem statement and objectives.

Thanking you,

Madurai
05 -08-15

your's sincerely,

(S.Kanis Rexcilin Frida.)

APPENDIX III

CONTENT VALIDITY CERTIFICATES

CERTIFICATE OF VALIDATION

This is to certify that the tool,

Section A : **part:A** demographic data, **part:B** obstetrical data

Section B : Internationally board certified lactation consultant scale

Prepared By Mrs.Kanis Rexcilin frida II year M.Sc(Nursing) student of Government Rajaji Hospital, Madurai. who has undertaken the study field titled of **" A Study to evaluate the the Effectiveness of closed system manual breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai"** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: Ms. Radha. C

DESIGNATION: Associate Professor

DATE: 04.06.2015

CERTIFICATE OF VALIDATION

This is to certify that the tool,

Section A : **part:A** demographic data, **part:B** obstetrical data

Section B : Internationally board certified lactation consultant scale

Prepared By Mrs.Kanis Rexcilin frida II year M.Sc(Nursing) student of Government Rajaji Hospital, Madurai. who has undertaken the study field titled of **" A Study to evaluate the the Effectiveness of closed system manual breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai"** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: JAYASANKARI S.

DESIGNATION: HOD Asso. prof. Dept of OBG.

DATE: 18/6/18

Suggestions presented

CERTIFICATE OF VALIDATION

This is to certify that the tool,

Section A : **part:A** demographic data, **part:B** obstetrical data

Section B : standardized 6 point scale

Prepared By Mrs.Kanis Rexcilin frida II year M.Sc(Nursing) student of Government Rajaji Hospital, Madurai. who has undertaken the study field titled of **" A Study to evaluate the the Effectiveness of closed system manual breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai"** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: P. SHANTHI

DESIGNATION: Professor in OG Dept.

DATE: 10/8/15

CERTIFICATE OF VALIDATION

This is to certify that the tool,

Section A : part:A demographic data. part:B obstetrical data

Section B : standardized 6 point scale

Prepared By Mrs.Kanis Rexcilin Frida II year M.Sc(Nursing) student of Government Rajaji Hospital, Madurai. who has undertaken the study field titled of " **A Study to evaluate the the Effectiveness of closed system manual breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai"** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: Dr. M.S. CHITRA MD DGO DNB

DESIGNATION:

Professor
Dept. of C&G
Govt. Rajaji Hospital
Madurai.

DATE: 05/08/15

CERTIFICATE OF VALIDATION

This is to certify that the tool,

Section A : **part:A** demographic data, **part:B** obstetrical data

Section B : standardized 6 point scale

Prepared By Mrs.Kanis Rexcilin frida II year M.Sc(Nursing) student of Government Rajaji Hospital, Madurai. who has undertaken the study field titled of " **A Study to evaluate the the Effectiveness of closed system manual breast pump and hand expresion on breast engorgement among Postnatal mothers in Postnatal ward at Government Rajaji Hospital, Madurai"** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: Dr

PROF & HOD
DEPT. OF O & G
Madurai Medical College
Madurai

DESIGNATION:

DATE: 05.02.15

APPENDIX IV

ஒப்புதல் அறிக்கை

பெயர்: **நாள் :**

எனக்கு இந்த செவிலிய ஆய்வு (பிரசவத்தி ற்கு பிறகு மார்பு பகுதியில் கட்டியுள்ள பாலை கருவி மூலம் வெளியேற்றுதல்) பற்றிய முழு விபரம் விளக்கமாக எடுத்துரைக்கப்பட்டது. இந்த ஆய்வில் பங்கு கொள்வதில் இருக்கும் நன்மைகள் மற்றும் பின்விளைவுகள் பற்றி முழுமையாக புரிந்து கொண்டேன். இந்த ஆய்வில் தானாக முன் வந்து பங்கு பெறுகிறேன்.மேலும் எனக்கு இந்த ஆய்வில் இருந்து எந்த சமயத்திலும் விலகி கொள்ள முழு அனுமதி வழங்கப்பட்டுள்ளது.என்னுடைய விபரங்களை பார்வையிட்டு அதை ஆய்வில் பயன்படுத்தி கொள்ள முழு அனுமதி அளிக்கிறேன்.என்னுடைய பெயர் மற்றும் அடையாளங்கள் இரகசியமாக வைத்து கொள்ளப்படும் என்றும் எனக்கு உறுதியளிக்கப்பட்டுள்ளது.

இப்படிக்கு,

APPENDIX V

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

From

S.Kanis Rexcilin Frida

I year M.Sc (N)

Madurai medical college

Madurai-20

To

The Dean,

Madurai Medical College,

Madurai – 20.

Through the proper channel,

Respected sir,

Sub: M.Sc(N) dissertation approval of proposal request-reg

As per the curriculum recommended by the Indian Nursing Council and Tamilnadu Dr.MGR Medical University all the M.Sc (N) students are required to conduct a dissertation study for the partial fulfillment of the course.

I have selected a topic on **"A study to evaluate the effectiveness of closed system manual breast pump and Hand expression on breast engorgement among postnatal mothers admitted in postnatal ward at Government Rajaji Hospital, Madurai" for my study.** I would like to conduct the study in postnatal ward.

So, kindly I request you to consider, guide and allow me to conduct the study.

Thanking you

Madurai

15-09-2014

Your sincerely,

(S.Kanis Rexcilin Frida)

Forwarded

Principal

COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

From

Mrs. S .Kanis Rexcilin Frida,

1st year M.Sc (Nursing),

College Of Nursing,

Madurai Medical College,

Madurai – 20.

To

The Professor and Head Of The Department,

Department Of Obstetrics and Gynaecology,

Government Rajaji Hospital,

Madurai – 20.

Through proper channel,

Respected Sir,

SUB: Requesting permission to conduct a study in postnatal ward -Regarding

As per the curriculum recommended by the INC and the Tamil Nadu Dr. M.G.R Medical University, all the M.Sc (nursing) students are required to conduct a study for the partial fulfillment of the course.

I have selected a topic on **"A study to evaluate the effectiveness of closed system manual breast pump and Hand expression on breast engorgement among postnatal mothers admitted in postnatal ward at Government Rajaji Hospital, Madurai" for my study.** I would like to conduct the study in postnatal ward.

So, kindly I request you to consider and permit me to conduct the study in Obstetrics and Gynaecology department.

Thanking You,

Madurai – 20,
03-07-2014

Yours Sincerely,

(Kanis Rexcilin Frida)

Forwarded for consideration.

Mrs. N. NAGARATHINAM, M.Sc.,
Lecturer in Pediatric Nursing
College of Nursing
Madurai Medical College
Madurai-625 020.

PROF. & HOD
DEPT. OF O & G
Madurai Medical College

APPENDIX VI

QUESTIONNAIRE- ENGLISH VERSION

PART--A

SOCIO DEMOGRAPHIC VARIABLES

Instruction

Please give a tick mark against the appropriate response in box provided

1. Age
    a. 15 to 20 years ☐
    b. 21 to 25years
    c. 26 to 30 years
    d. Above 30years
2. Education
    a. No formal education ☐
    b. Primary
    c. Degree
    d. Higher secondary
3. Occupation
    a. Housewife ☐
    b. Govt employee
    c. Private worker
    d. Cooly

4. Monthly Income
    a. Rs.2000 to 5000 ☐
    b. Rs.5001 to 10,000
    c. Rs.10001 to 15,000
    d. Above Rs.15,000
5. Religion
    a. Hindu ☐
    b. Muslim
    c. Christian
    d. Other
6. Type of Family
    a. Nuclear family ☐
    b. Joint family
    c. Extended family
    d. Separated family
7. Social support-Postnatal
    a. Husband ☐
    b. Friends and Neighbours
    c. Relative
    d. No social support
8. Living area
    a. Urban ☐
    b. Rural

9. Maternal dietary pattern

   a. vegitarian ☐

   b. non vegitarian

   c. eggetarian

10. Related information

   a.No previous information ☐

   b. Health personal

   c. Friends

   d.family members

PART- B

OBSTETRICAL VARIABLES

1. Maternal BMI
    a. Below 18.5 ☐
    b. 18.6-25
    c. 25.1-30
    d. Above 30
2. No of Children
    a. 1 child ☐
    b. 2 child
    c. 3 child
    d. Above 3 child
3. Type of delivery
    a. Normal vaginal delivery ☐
    b. LSCS
    c. Forceps Delivery
    d. Vacuum Delivery
4. Sex of the baby
    a. Male ☐
    b. Female
5. Obstetrical Outcome

    a.Preterm Baby ☐

    b.IUGR Baby

c.Congenital anomaly

d.Healthy baby

6. Feeding pattern to Newborn

a.Feeding in breast ☐

b.Expressed breast Milk

c.Bottle feeding

7. Number of post partum day

a.5-10 days ☐

b. 11-15 days

c.15-20 days

d.above 20 days

பகுதிஅ

தன்னிலைவிபரக்குறிப்பு

குறிப்பு :எதிரேஉள்ளகட்டங்களில் [√]மார்க்செய்யவும்

1வயதுவருடங்களில்

அ.15-20 ☐

ஆ21-25

இ26-30

ஈ.30க்குமேல்

2.கல்வித்தகுதி

அ.படிக்காதவர் ☐

ஆ.ஆரம்பக்கல்வி

இ.உயர்நிலைக்கல்வி

ஈ.பட்டப்படிப்பு

3.தொழில்

அ.குடும்பத்தலைவி ☐

ஆ.அரசாங்கவேலை

இ.தனியார்வேலை

ஈ.கூலி

4.குடும்பவருமானம்

அ .ரூ. 2000 முதல் 5000 வரை ☐

ஆ .ரூ.5001 முதல் 10000வரை

இ .ரூ.10001 முதல் 15000 வரை

ஈ .ரூ.15000க்குமேல்

5.மதம்

அ.ஹிந்து ☐

ஆ.முஸ்லீம்

இ.கிறிஸ்துவம்

ஈ.எந்தஒருமதத்துவத்துவதையும்சாராதவர்

6.குடும்பவகை

அ.தனிகுடும்பம் ☐

ஆ.கூட்டுகுடும்பம்

இ.மிககூட்டுகுடும்பம்

ஈ.பிரிந்துவாழும்குடும்பம்

7.கர்ப்பகாலத்திற்குபின்சமூகஆதரவு

அ.கணவர் ☐

ஆ.நண்பர்கள்மற்றும்அண்டைவீட்டுக்காரர்கள்

இ.உறவினர்கள்

8.வசிப்பிடம்

அ.கிராமம் ☐

ஆ.நகரம்

9.தாயின்உணவுமுறை

அ.சைவம் ☐

ஆ.அசைவம்

இ.முட்டைமட்டும்சாப்பிடுபவர்

10.இதற்குமுன்தாய்ப்பால்பீச்சிஎடுக்கும்முறைபற்றியதகவல்களைபெற்றதுஉண்டா?ஆம்என்றால்எங்கிருந்துபெற்றீர்கள்?

அ.இல்லை ☐

ஆ.சுகாதாரதுறைஊழியர்கள்மூலம்

இகுடும்ப. உறவினர்கள்

ஈ.நண்பர்கள்மூலம்

பகுதி-ஆ

மகப்பேறுவிபரக்குறிப்பு

1.தாயின்உடல்பருமன்குறியீடு

அ. 18.5 க்குகீழ் ☐

ஆ.18.6-25

இ.25.1-30

ஈ30க்குமேல்

2. குழந்தைகளின்எண்ணிக்கை

அ.ஒன்று ☐

ஆ.இரண்டு

இ.மூன்று

ஈ.மூன்றுக்குமேல்

3. பிரசவவகை

அ.சுகப்பிரசவம்

ஆ.அறுவைசிகிச்சை ☐

இ.ஆயுதபிரசவம்

4.குழந்தையின்பாலினம் ☐

அ.ஆண்

5.மகபேறின்விளைவு

அ.குறைமாதகுழந்தை ☐

ஆ.எடைகுறைவானகுழந்தை

இ.குறைபாடுடையகுழந்தை

இ.நலமானகுழந்தை

6.குழந்தைக்குபாலூட்டும்முறை ☐

அ.தாய்ப்பால்தாய்யிடமிருந்துமட்டும்

ஆ .தாய்ப்பால்தாய்யிடமிருந்துபீச்சிஎடுத்தல்

இ.புட்டிப்பால்ஊட்டுதல்

ஈ.இல்லை

7.பிரசவநாட்கள் ☐

அ .5முதல் 10நாட்கள்

ஆ .11முதல் 15நாட்கள்

இ .16முதல்20 நாட்கள்

ஈ .20நாட்கள்மேல்

APPENDIX VII

ENGLISH EDITING CERTIFICATE

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation by S.KANIS REXCILIN FRIDA II year M.Sc(N) student, College of nursing, Madurai medical college, Madurai, who has undertaken the study field on dissertation entitled **"EFFECTIVENESS OF CLOSED SYSTEM MANUAL BREAST PUMP AND HAND EXPRESION ON BREAST ENGORGEMENT AMONG POSTNATAL MOTHERS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI."** Has been edited for English language appropriateness.

SIGNATURE:

NAME: SHANTHI. N M.A., B.Ed.,

DESIGNATION: B.T. Asst.,

INSTITUTION:

APPENDIX VIII

TAMIL EDITING CERTIFICATE

CERTIFICATE OF TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation by S.KANIS REXCILIN FRIDA II year M.Sc(N) student, College of nursing, Madurai medical college, Madurai, who has undertaken the study field on dissertation entitled **"EFFECTIVENESS OF CLOSED SYSTEM MANUAL BREAST PUMP AND HAND EXPRESION ON BREAST ENGORGEMENT AMONG POSTNATAL MOTHERS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI."** Has been edited for Tamil language appropriateness.

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Melur (Tk), Madurai-625 109.

APPENDIX-IX

PHOTOGRAPHS

APPLYING CLOSED SYSTEM MANUAL BREAST PUMP

HAND EXPRESSION OF BREAST MILK FROM A POSTNATAL MOTHER

CLOSED SYSTEM MANUAL BREAST PUMP DEVICES